Environmental information — Competence requirements for teams validating and verifying environmental information

Informations environnementales — Exigences de compétence pour les équipes de validation et les équipes de vérification des informations environnemenrales

Contents

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 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).

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This document was prepared jointly by Technical Committee ISO/TC 207, *Environmental management,* Subcommittee SC 7, *Greenhouse gas and climate change management and related activities*, in collaboration with Subcommittee SC 2, *Environmental auditing and related environmental investigations*, and ISO/CASCO, *Committee on conformity assessment*.

This second edition cancels and replaces the first edition (ISO 14066:2011), which has been technically revised.

The main changes are as follows:

— the scope has been extended from greenhouse gas to environmental information claims;

— annexes providing additional competence requirements for certain types of environmental information statements have been added.

A list of all parts in the ISO 14000 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies competence requirements for validation and verification teams (including technical experts) and independent reviewers for the benefit of environmental information programme administrators, regulators, and validation and verification bodies. To achieve consistency in the international marketplace and maintain public confidence in environmental information reporting and other communications, there is a need to define competence requirements for validation and verification teams (including technical experts) and independent reviewers.

Requirements for environmental information validation and verification bodies are established in ISO 14065. ISO 14065 requires that validation and verification bodies establish and maintain a procedure to manage the competence of its personnel undertaking the various validation or verification activities within the team and independent reviewer appointed for the engagement. It is the role of the validation or verification body to ensure that validation and verification teams (including technical experts) and independent reviewers have the necessary competence to effectively complete the validation or verification process. This document includes principles for ensuring competence of validation and verification teams (including technical experts) and independent reviewers. Supporting these principles are general requirements based on the tasks that validation or verification teams (including technical experts) and independent reviewers need to be able to perform and the competence required to do so.

This document can be used in conjunction with ISO 14065 as the basis for assessing and recognizing the competence of validation and verification teams (including technical experts) and independent reviewers.

Users of this document are encouraged to refer to applicable standards for the preparation of environmental information statements (see ISO 14016, ISO 14020, ISO 14021, ISO 14024, ISO 14025, ISO 14026, ISO 14030-1, ISO 14030-2, ISO 14030-3, ISO 14040, ISO 14044, ISO 14046, ISO 14064-1, ISO 14064-2, ISO 14067 and ISO 14097).

Environmental information — Competence requirements for teams validating and verifying environmental information

1 Scope

This document specifies competence requirements for validation and verification teams (including technical experts) and independent reviewers.

This document is applicable to all organizations that plan and conduct external or internal validations, verifications and agreed-upon procedures (AUP).

This document is not linked to any particular environmental information programme. If a particular environmental information programme is applicable, competence requirements of that environmental information programme are additional to the requirements of this document.

NOTE   Management process requirements for the competence of personnel are specified in ISO 14065:2020, 7.3.

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 14030-4, *Environmental performance evaluation — Green debt instruments — Part 4: Verification programme requirements*

ISO 14065:2020, *General principles and requirements for bodies validating and verifying environmental information*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1 Terms specific to competence

3.1.1
professional scepticism
attitude that includes a questioning mind and a critical assessment of evidence

[SOURCE: ISO 14050:2020, 3.4.14]

3.1.2
competence
ability to apply knowledge and skills to achieve intended results

[SOURCE: ISO 14050:2020, 3.1.10]

3.2   Terms related to environmental information

3.2.1
environment
surroundings in which an *organization* ([3.3.3](#)) operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships

Note 1 to entry: Surroundings can extend from within an organization to the local, regional and global system.

Note 2 to entry: Surroundings can be described in terms of biodiversity, ecosystems, climate or other characteristics.

[SOURCE: ISO 14001:2015, 3.2.1]

3.2.2
environmental performance
measurable results related to the management of environmental aspects

Note 1 to entry: Environmental aspects are elements of an *organization's* ([3.3.3](#)) activities or products or services that interact or can interact with the *environment* ([3.2.1](#)) (ISO 14001:2015, 3.2.2).

[SOURCE: ISO 14050:2020, 3.2.27, modified — "measurable results" replaced "performance". Note 1 to entry added.]

3.2.3
environmental information
subject matter of a qualitative or quantitative nature that is related to environmental conditions or *environmental performance* ([3.2.2](#))

Note 1 to entry: Environmental information can include statements and claims regarding greenhouse gas emissions, removals, emission reductions or removal enhancements of an *organization* ([3.3.3](#)), project (e.g. see ISO 14064-1 and ISO 14064-2), environmental footprints (e.g. see ISO 14067 for carbon footprints of a product, ISO 14046 for water footprints and ISO 14044 for life cycle assessment information) or environmental reports (e.g. see ISO 14016).

Note 2 to entry: ISO 14033 defines and specifies terms and procedures to establish reviewable and comparable quantitative environmental information.

[SOURCE: ISO 14065:2020, 3.1.4]

3.2.4
environmental information statement
declaration of *environmental information* ([3.2.3](#))

Note 1 to entry: The environmental information statement can represent a point in time or can cover a period of time.

Note 2 to entry: The environmental information statement provided by the *responsible party* ([3.3.4](#)) should be clearly identifiable and capable of consistent evaluation or measurement against suitable *criteria* ([3.4.16](#)) by a *verifier* ([3.4.6](#)) or *validator* ([3.4.2](#)).

Note 3 to entry: The environmental information statement can be provided in: a report; a declaration; an economic, financial, or monetary valuation; an environmental product declaration; a life cycle assessment report; a climate change vulnerability or adaptation evaluation; a project plan; a label or logo.

Note 4 to entry: The term "environmental information statement" corresponds to the term "claim" used in ISO/IEC 17029:2019, 3.1.

[SOURCE: ISO 14065:2020, 3.1.5]

3.2.5
environmental information programme
rules and procedures for providing an *environmental information statement* (3.2.4)

Note 1 to entry: Environmental information programmes can be carried out at international, regional, national or subnational levels.

Note 2 to entry: A programme can also be called a "scheme".

Note 3 to entry: Greenhouse gas emissions and removals, emission reductions or removal enhancements, greenhouse gas inventories, product carbon footprints and water footprints, and the *environmental information* (3.2.3) in sustainability reports are examples of subjects that may be verified in accordance with an environmental information programme.

Note 4 to entry: An environmental information programme may include requirements for *validation* (3.4.1) or *verification* (3.4.5).

3.2.6
sector
technical area sharing common attributes and similar environmental aspects

Note 1 to entry: Environmental aspects are elements of an *organization's* (3.3.3) activities or products or services that interact or can interact with the *environment* (3.2.1) (ISO 14001:2015, 3.2.2).

3.3 Terms related to people and organizations

3.3.1
client
organization (3.3.3) or person requesting *verification* (3.4.5) or *validation* (3.4.1)

Note 1 to entry: The client could be the *responsible party* (3.3.4), the environmental information programme administrator or other interested party.

[SOURCE: ISO 14064-3:2019, 3.2.5, modified — "environmental information" replaced "GHG".]

3.3.2
intended user
individual or *organization* (3.3.3) identified by those reporting *environmental information* (3.2.3) as being the one who relies on that information to make decisions

Note 1 to entry: The intended user could be the *client* (3.3.1), the *responsible party* (3.3.4), environmental information programme administrators, regulators, the financial community, or other interested parties, such as local communities, government departments or non-governmental organizations.

[SOURCE: ISO 14065:2020, 3.2.4, modified — "environmental information programme administrators" replaced "programme owners", "the general public" deleted, and "government departments" replaced "governmental" in Note 1 to entry.]

3.3.3
organization
person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

[SOURCE: ISO 14065:2020 3.2.2.]

3.3.4
responsible party
person or persons responsible for the provision of the *environmental information statement* (3.2.4) and the supporting information

Note 1 to entry: The responsible party can be either individuals or authorized representatives of an *organization* (3.3.3) or project and can be the party who engages the *verifier* (3.4.6) or *validator* (3.4.2).

Note 2 to entry: The responsible party may be the *client* (3.3.1).

[SOURCE: ISO 14065:2020, 3.2.3]

3.3.5
technical expert
person who provides specific knowledge on a specified subject

Note 1 to entry: A technical expert to the *validation team* (3.4.7) or *verification team* (3.4.8) does not act as a *validator* (3.4.2) or *verifier* (3.4.6).

[SOURCE: ISO 14050:2020 3.4.36, modified — Note 1 to entry added.]

3.4   Terms related to validation and verification

3.4.1
environmental information validation
validation
process for evaluating the reasonableness of the assumptions, limitations and methods that support an *environmental information statement* (3.2.4) about the outcome of future activities

Note 1 to entry: The term "environmental information validation" is shortened to "validation" in this document to reduce sentence complexity and aid understanding.

[SOURCE: ISO 14065:2020, 3.3.16]

3.4.2
validator
competent and impartial person with responsibility for performing and reporting on a *validation* (3.4.1)

[SOURCE: ISO 14065:2020 3.3.6.]

3.4.3
validation opinion
formal written declaration to the *intended user* (3.3.2) on the reasonableness of the assumptions, methods and limitations used to develop forecasts and projections contained in the *environmental information statement* (3.2.4)

Note 1 to entry: The term "validation opinion" is a type of "validation statement" in ISO/IEC 17029:2019, 3.6.

Note 2 to entry: Reasonableness of the assumptions, methods and limitations includes consideration of conformity to applicable *criteria* (3.4.16).

[SOURCE: ISO 14065:2020, 3.3.25]

3.4.4
verification opinion
formal written declaration to the i*ntended user* (3.3.2) that provides confidence that the *environmental information statement* (3.2.4) is materially correct and conforms with the *criteria* (3.4.16)

Note 1 to entry: The term "verification opinion" is a type of "verification statement" in ISO/IEC 17029:2019, 3.7.

[SOURCE: ISO 14065:2020, 3.3.23]

3.4.5
environmental information verification
verification
process for evaluating an *environmental information statement* (3.2.4) based on historical data and information to determine whether the statement is materially correct and conforms to *criteria* (3.4.16)

Note 1 to entry: Verification activities performed that do not lead to the expression of an opinion are called *agreed-upon procedures* (3.4.14).

Note 2 to entry: The term "environmental information verification" is shortened to "verification" in this document to reduce sentence complexity and aid understanding.

[SOURCE: ISO 14065:2020, 3.3.15]

3.4.6
verifier
competent and impartial person with responsibility for performing and reporting on a *verification* (3.4.5)

[SOURCE: ISO 14065:2020, 3.3.5]

3.4.7
validation team
one or more *validators* (3.4.2) conducting *validation* (3.4.1) activities, supported if needed by *technical experts* (3.3.5)

Note 1 to entry: One person of the validation team is appointed as the *team leader* (3.4.9).

Note 2 to entry: The validation team may be accompanied by validators-in-training.

[SOURCE: ISO 14050:2020, 3.4.23, modified — "validation activities" replaced "a validation". Notes 1 and 2 to entry added.]

3.4.8
verification team
one or more *verifiers* (3.4.6) conducting *verification* (3.4.5) activities, supported if needed by *technical experts* (3.3.5)

Note 1 to entry: One person of the verification team is appointed as the *team leader* (3.4.9).

Note 2 to entry: The verification team may be accompanied by verifiers-in-training.

[SOURCE: ISO 14050:2020, 3.4.3, modified — "verification activities" replaced "a verification". Notes 1 and 2 to entry added.]

3.4.9
team leader
person who manages the *validation team* (3.4.7) or *verification team* (3.4.8)

3.4.10
independent reviewer
competent person, who is not a member of the *validation team* (3.4.7) or *verification team* (3.4.8), who reviews the *verification* (3.4.5) or *validation* (3.4.1) activities and conclusions

[SOURCE: ISO 14065:2020, 3.3.8, modified — "validation team or verification team" replaced "validation/verification team".]

3.4.11
engagement
arrangement between the validation or verification body and its *client* ([3.3.1](#)) with the terms to perform services, usually specified in the form of a contract

Note 1 to entry: The word "engagement" is also sometimes used to refer to the activities performed under an engagement, such as a *validation* ([3.4.1](#)) or a *verification* ([3.4.5](#)), or an agreement to perform *agreed-upon procedures* ([3.4.14](#)).

[SOURCE: ISO 14065:2020, 3.3.13]

3.4.12
assurance
confidence in an *environmental information statement* ([3.2.4](#)) that is historical in nature

[SOURCE: ISO 14065:2020, 3.3.14]

3.4.13
assurance engagement risk
risk that the *verifier* ([3.4.6](#)) expresses an inappropriate conclusion when the subject matter information is materially misstated

[SOURCE: IAASB, 2014[25]]

3.4.14
agreed-upon procedures
AUP
engagement ([3.4.11](#)) that reports on the results of *verification* ([3.4.5](#)) activities and does not provide an opinion

Note 1 to entry: Agreed-upon procedures do not provide *assurance* ([3.4.12](#)).

[SOURCE: ISO 14065:2020, 3.3.17]

3.4.15
level of assurance
degree of confidence in the *environmental information statement* ([3.2.4](#))

Note 1 to entry: *Assurance* ([3.4.12](#)) is provided on historical information.

[SOURCE: ISO 14065:2020, 3.3.18]

3.4.16
criteria
policies, procedures, or requirements used as a reference against which the *environmental information statement* ([3.2.4](#)) is compared

Note 1 to entry: Criteria may be established by governments, regulators, *environmental information programmes* ([3.2.5](#)), voluntary reporting initiatives, standards, codes of practice, or internal procedures.

Note 2 to entry: "Criteria" is used in place of "specified requirements" used in ISO/IEC 17029.

[SOURCE: ISO 14065:2020, 3.3.20]

3.4.17
misstatement
error, omission, misreporting or misrepresentation in the *environmental information statement* (3.2.4)

Note 1 to entry: Misstatement can be qualitative or quantitative.

[SOURCE: ISO 14065:2020, 3.3.21]

3.4.18
material misstatement
individual *misstatement* (3.4.17) or the aggregate of actual misstatements in the *environmental information statement* (3.2.4) that could affect the decisions of the *intended users* (3.3.2)

[SOURCE: ISO 14065:2020, 3.3.22]

3.4.19
fraud
intentional *misstatement* (3.4.17) made wrongfully or criminally for financial or personal gain

3.4.20
report of factual findings
documented output of *agreed-upon procedures* (3.4.14)

Note 1 to entry: The term "report of factual findings" is a type of "verification statement" in ISO/IEC 17029:2019, 3.7.

[SOURCE: ISO 14065:2020, 3.3.24]

3.4.21
materiality
concept that individual *misstatements* (3.4.17) or the aggregation of misstatements could influence the *intended users'* (3.3.2) decisions

[SOURCE: ISO 14065:2020, 3.3.19]

3.4.22
test
technique used to assess a characteristic of items in a sampled population of environmental data and information against *verification* (3.4.5) or *validation* (3.4.1)*criteria* (3.4.16)

Note 1 to entry: Characteristics can include accuracy, completeness, functionality, knowledge, quality, and veracity. Characteristics can also refer to greenhouse-gas-related activities described in ISO 14064-3:2019, 7.1.4.1, or analogous attributes of other *environmental information statements* (3.2.4).

[SOURCE: ISO 14064-3:2019, 3.6.21, modified — "environmental information" replaced "GHG". Note to entry added.]

3.4.23
sufficient
measure of the quantity of evidence

3.4.24
appropriate
measure of the quality of evidence, i.e. its relevance and its reliability

3.5 Terms related to debt instruments

3.5.1
issuer
entity responsible for fulfilling the contractual obligations of the bond or other debt instrument

[SOURCE: ISO 14030-1:2021, 3.1.5]

3.5.2
borrower
person or entity who has contracted a loan

[SOURCE: ISO 14030-2:2021, 3.1.3]

4 Principles

4.1 General

The application of principles is fundamental to:

— the performance of validation and verification by members of teams;

— the evaluation of knowledge, skills and behaviour in carrying out validation and verification.

Principles are the basis for, and will guide the application of, the requirements in this document.

4.2 Integrity

Integrity is the demonstration of fair behaviour through trust, honesty, working with diligence and responsibility, observing the law, maintaining confidentiality and making disclosures expected by the law and the profession throughout the validation or verification process.

4.3 Fair presentation

Fair presentation is reflecting truthfully and accurately validation or verification activities, findings, conclusions and reports, and reporting significant obstacles encountered during the validation or verification process.

4.4 Due professional care

Due professional care is exercising due care and judgement in accordance with the risk attributed to the task performed and the confidence placed by clients and intended users, and having the necessary competence to undertake the validation or verification.

4.5 Professional judgement

Professional judgement is being able to draw meaningful and accurate conclusions, give opinions and make interpretations based on observations, knowledge, experience, literature and other sources of information, and demonstrating professional scepticism.

NOTE   Annex A provides guidance on evidence and the application of professional scepticism.

4.6 Impartiality

Impartiality for team members and independent reviewers is related to threats to impartiality which can include, but are not limited to, the following:

a) Self-interest: threats that arise from a person acting in their own interest. A concern related to validation/verification, as a threat to impartiality, is financial self-interest.

b) Self-review: threats that arise from a person reviewing the work done by themselves.

c) Familiarity (or trust): threats that arise from a person being too familiar with the responsible party undergoing validation/verification/AUP or trusting of another person instead of seeking evidence for validation/verification.

d) Intimidation: threats that arise from a person having a perception of being coerced openly or secretively, such as a threat to be replaced or reported to a supervisor.

4.7 Evidence-based approach

Evidence is verifiable. It is based on a sampling of information. The appropriate use of sampling is closely related to the confidence that can be placed in the validation and verification conclusions.

5 Application of principles

Validation and verification team members (including technical experts) and independent reviewers in performing their work shall take into account the principles in Clause 4.

6 Team competence

6.1 General

A validation or a verification team collectively shall have the required competence to perform validation or verification activities, including, as applicable, the competence, experience and expertise defined in Annexes E and F.

NOTE 1   ISO 14065:2020, 7.3, defines requirements for the management of personnel competence.

NOTE 2   Annex B outlines methods that can be used to evaluate the competence of validation and verification teams (including technical experts) and independent reviewers.

6.2 Knowledge

6.2.1 General

A validation or a verification team collectively shall possess the following:

a) environmental information programme knowledge (see 6.2.2);

b) quantitative and qualitative information knowledge (see 6.2.3);

c) auditing knowledge (see 6.2.7);

d) knowledge of types of engagements including validation, verification, AUP and mixed engagements, as applicable.

A validation or verification team shall include a member with team leader skills (see 6.3.2).

6.2.2 Environmental information programme knowledge

A validation or a verification team collectively shall have environmental information programme knowledge, including, as applicable, about the following:

a) eligibility requirements;

b) legal requirements;

c) validation or verification programme requirements and guidelines.

6.2.3 Quantitative and qualitative information knowledge

A validation or a verification team collectively shall have quantitative and qualitative information knowledge, including, as applicable, about the following:

a) sector(s) relevant to the environmental information statement;

b) relevant quantification methodologies, including measurement and modelling approaches, monitoring techniques and their consequences for data quality;

c) calibration procedures and their consequences for data quality;

d) reporting principles (e.g. completeness, consistency, accuracy, transparency and relevance);

e) materiality and material discrepancy.

6.2.4 Additional knowledge for organization level statements

A verification team collectively shall have additional knowledge about the quantification of environmental information at the organizational level including principles and criteria, processes, procedures and methodologies for, as applicable:

a) determining organizational and reporting boundaries;

b) developing declarations of environmental status (such as carbon neutrality);

c) developing claims related to actions taken;

d) organizational life cycle assessments.

6.2.5 Additional knowledge for the verification of environmental information statements related to products

A verification team collectively shall have additional knowledge about the verification of environmental information at the level of products and claims, including principles and criteria, processes, procedures and methodologies of, as applicable:

a) life cycle assessments;

b) environmental product declarations, claims and ecolabels;

c) claims related to characteristics of financial products;

d) product related declarations of environmental status such as carbon neutrality and other related statements.

6.2.6 Additional knowledge for the validation/verification of environmental information statements related to projects

A validation or a verification team collectively shall have additional knowledge with respect to the validation/verification of an environmental statement at the level of a project, including principles and criteria, processes, procedures and methodologies about, as applicable:

a) project boundaries;

b) quantification methodologies;

c)   monitoring and reporting.

6.2.7   Auditing knowledge

A validation or a verification team collectively shall have auditing knowledge, including about the following:

a)   methodologies for data and information auditing and risk assessment;

b)   techniques for data and information sampling;

c)   typical controls for data and information systems and supporting processes.

6.3   Skills

6.3.1   Team skills

A validation or a verification team collectively shall have the necessary skills to perform validation or verification activities, including the ability to:

a)   identify and evaluate validation/verification risks against the criteria and materiality, including when changes occur, new information becomes available, or nonconformity or misstatements become apparent;

b)   conduct validation/verification activities to evaluate evidence against criteria;

c)   evaluate the evidence for sufficiency and appropriateness;

d)   challenge the evidence, demonstrate professional scepticism and, when necessary, carry out independent research;

e)   draw appropriate conclusions from evidence;

f)   communicate about the validation/verification process and its results as expressed in findings, opinions and reports of factual findings.

NOTE   Annex B outlines methods that can be used to evaluate the skills of validation and verification teams (including technical experts) and independent reviewers.

6.3.2   Team leader skills

A team leader shall have sufficient skill to assess the following:

a)   competence of team members;

b)   risks associated with the performance of validation or verification activities;

c)   adequacy of resources available to the team;

d)   conclusions reached in the validation or verification opinion.

7   Technical expert competence

A technical expert shall provide the validation/verification team with specialist knowledge, which may be sector specific.

Technical experts are not subject to the competence requirements in Clause 6 as they are not validators or verifiers.

8 Competence of the independent reviewer

The independent reviewer shall have the following competences (as applicable):

— skills at the level of team leader;

— knowledge as set out in 6.2, excluding 6.2.3 c);

— skills as set out in 6.3.1.

NOTE 1   The independent reviewer can be one or more persons.

NOTE 2   As long as personnel conducting the independent review have not participated in validation or verification activities under the direction of the team leader, they are not considered to be members of the validation or verification team (even if they observed all or a portion of the validation or verification team's activities).

9 Demonstration and maintenance of validation and verification knowledge and skills

9.1 Demonstration of knowledge and skills

For the purposes of achieving initial or supplemental qualifications to undertake validation or verification activities for given sectors, validators or verifiers shall demonstrate their knowledge and skills through a variety of evidence, including one or more of the following:

a)   education;

b)   training;

c)   work experience relevant to the competence required for the activity;

d)   tutoring or mentoring by more experienced staff (e.g. other members of the validation or verification team).

NOTE 1   This clause is intended to encourage the development of professionals.

NOTE 2   Examples of work experience can include employment, consulting, project development or professional auditing in the technical area.

NOTE 3   Practical experience, especially in an environment in which teamwork is encouraged, helps less experienced team members to develop attitudes of professional scepticism and make sounder judgements concerning the assessment of risk, and the sufficiency and appropriateness of evidence.

NOTE 4   Annex C provides examples of prerequisite entry-level awareness for individuals starting training as validators or verifiers.

NOTE 5   Annex D outlines personal behaviour for validators and verifiers.

9.2 Maintenance of knowledge and skills

Validators or verifiers and independent reviewers should maintain knowledge and skills through ongoing awareness of developments in the sectors of their competence, including relevant national and international environmental information programmes, applicable science and relevant legal requirements.

A validator or a verifier or independent reviewer should also undertake a programme of continuing professional development, including training, consistent with emerging trends in applicable environmental information programmes.

NOTE 1   Requirements for the maintenance of team members' personnel records are given in ISO 14065:2020, 9.11.

NOTE 2   As specified in ISO 14065:2020, 7.3, team member performance (e.g. the demonstration of knowledge and skills) is periodically monitored.

NOTE 3   Annex B provides methods that can be used to evaluate the knowledge and skills of validation or verification teams (including technical experts) and independent reviewers.

Annex A
(informative)

Evidence and the application of professional scepticism

A.1 Evidence

Members of the validation or the verification team plan and perform a validation/verification with an attitude of professional scepticism to obtain sufficient appropriate evidence about whether the subject matter information is free of material misstatement. Members of the validation or the verification team consider materiality, assurance engagement risk, the possibility of fraud, and the quantity and quality of available evidence when planning and performing the engagement, in particular when determining the nature, timing and extent of evidence-gathering procedures.

Members of the validation or the verification team plan and perform a validation/verification with an attitude of professional scepticism recognizing that circumstances can exist that cause the subject matter information to be materially misstated. An attitude of professional scepticism means that members of the validation or the verification team make a critical assessment, with a questioning mind, of the validity of evidence obtained and are alert to evidence that contradicts or brings into question the reliability of documents or representations by the responsible party.

EXAMPLE   An attitude of professional scepticism is necessary throughout the engagement process for members of the validation or the verification team to reduce the risk of overlooking suspicious circumstances, of overgeneralizing when drawing conclusions from observations, and of using faulty assumptions in determining the nature, timing and extent of evidence-gathering procedures, and evaluating the results thereof.

Members of the validation or the verification team consider the reliability of the information to be used as evidence (e.g. photocopies, facsimiles, filmed, digitized or other electronic documents), including consideration of controls over their preparation and maintenance where relevant. Although members of the validation or the verification team are not trained or expected to be technical experts in authentication, on rare occasions the validation/verification can involve the authentication of documentation.

A.2 Sufficient and appropriate evidence

The quantity of evidence needed is affected by the risk of the subject matter information being materially misstated (the greater the risk, the more evidence is likely to be required) and also by the quality of such evidence (the higher the quality, the less can be required). Accordingly, the sufficiency and appropriateness of evidence are interrelated. However, merely obtaining more evidence does not always compensate for its poor quality.

The reliability of evidence is influenced by its source and nature, and is dependent on the individual circumstances under which it is obtained. Generalizations about the reliability of various kinds of evidence can be made, However, such generalizations are subject to important exceptions. Even when evidence is obtained from sources external to the organization, circumstances can exist that can affect the reliability of the information obtained.

EXAMPLE 1   Evidence obtained from an independent external source is not necessarily reliable if the source is not knowledgeable.

While recognizing that exceptions can exist, the following generalizations about the reliability of evidence can be useful:

— evidence is more reliable when it is obtained from independent sources outside the organization;

— evidence that is generated internally is more reliable when the related controls are effective;

— evidence obtained directly by the validation or verification team is more reliable than evidence obtained indirectly or by inference (e.g. observation of the application of a control is more reliable than an inquiry about the application of a control);

— evidence is more reliable when it exists in documentary form, whether paper, electronic or other media (e.g. a contemporaneously written record or an unedited photo or video of a meeting is more reliable than a subsequent oral representation of what was discussed);

— evidence provided by original documents is more reliable than evidence provided by photocopies, screenshots or scans.

Members of the validation or the verification team ordinarily obtain more assurance from consistent evidence obtained from different sources or of a different nature than from items of evidence considered individually. In addition, obtaining evidence from different sources or of a different nature can indicate that an individual item of evidence is not reliable.

EXAMPLE 2   Corroborating information obtained from a source independent of the organization can increase the assurance the validation or verification team obtains from a representation from the responsible party.

Conversely, when evidence obtained from one source is inconsistent with that obtained from another, the validation or verification team determines what additional evidence-gathering procedures are necessary to resolve the inconsistency.

In terms of obtaining sufficient appropriate evidence, it is generally more difficult to obtain assurance about subject matter information covering a period than about subject matter information at a point in time. In addition, conclusions provided on processes are ordinarily limited to the period covered by the engagement; members of the validation or the verification team provide no conclusion about whether the process will continue to function in the specified manner in the future.

The validation or verification team considers the relationship between the cost of obtaining evidence and the usefulness of the information obtained. However, the matter of difficulty or expense involved is not in itself a valid basis for omitting an evidence-gathering procedure for which there is no alternative. The validation or verification team uses professional judgement and exercises professional scepticism in evaluating the quantity and quality of evidence, and thus its sufficiency and appropriateness, to support the assurance report.

Annex B
(informative)

Methods to evaluate the competence of validation and verification teams (including technical experts) and independent reviewers

Table B.1 — Methods to evaluate the competence of validation and verification teams (including technical experts) and independent reviewers

Evaluation method	Objectives	Examples
Records review	To verify the knowledge of validation or verification teams (including technical experts) and independent reviewers.	Analysis of records of education, personnel certification, training, professional experience and validation or verification experience.
Positive and negative feedback	To receive information about how the performance of the validation or verification teams (including technical experts) and independent reviewers are perceived, including behaviour.	Surveys, questionnaires, personal references, testimonials, complaints, performance evaluation and reviews.
Interview	To evaluate personal behaviour and communication skills, to verify information, to test knowledge and to acquire additional information.	Face-to-face, video and telephone interviews.
Observation	To evaluate personal behaviour and the ability to apply knowledge and skills.	Role playing, witnessed validations/ verifications, on-the-job performance.
Examination and testing	To evaluate personal behaviour and the application of knowledge and skills.	Oral and written exams, psychometric testing.
Post-validation/ verification review	To evaluate knowledge or performance.	Review of the validation opinion or verification opinion and discussion with the client, responsible party, and with the validation and verification team.

Annex C
(informative)

Example of prerequisite entry level awareness for individuals starting training to participate in validation or verification

C.1 General

Individuals starting training as team members in a validation or a verification team (referred to as "trainees") should possess an interest in validation or verification and exhibit personal behaviour suitable for participating in validation or verification teams. Clauses C.2 and C.3 provide an example of prerequisite awareness and abilities that trainees may possess at the beginning of their training process.

NOTE   This does not apply to technical experts.

C.2 Awareness

Awareness can include the following:

a)   general understanding of the sector(s) relevant to environmental information statements;

b)   general understanding about environmental information programmes applicable to the types of validation or verification the individual may eventually participate in as a team member;

c)   common legal structures applicable to the management of organizations, claims and product declarations;

d)   typical operation and control of environmental information systems.

C.3 Abilities

Abilities can include the following:

a)   critical thinking;

b)   analysing multiple inputs;

c)   willingness to think outside cultural constraints and norms;

d)   exercising professional scepticism;

e)   carrying out independent research and challenging assumptions and evidence asserted by a responsible party or client;

f)   striking a balance between "attention to detail" and a "high level assessment of the anticipated outcome" during the validation or verification process;

g)   managing and organizing detail, particularly at the level of ensuring that required checks are performed on data during verification or validation.

Annex D
(informative)

Personal behaviour

NOTE   This annex is adapted from ISO 19011:2018.

Validation and verification teams (including technical experts) and independent reviewers involved in environmental information validation and verification activities should possess the necessary qualities to enable them to act in accordance with the principles of validation and verification as described in Clause 4. Validation and verification teams (including technical experts) and independent reviewers should exhibit professional behaviour during the performance of validation and verification activities that includes being the following:

a)   ethical, i.e. fair, truthful, sincere, honest and discreet;

b)   open-minded, i.e. willingness to consider alternative ideas or points of view;

c)   diplomatic, i.e. tact in dealing with people;

d)   observant, i.e. active observation of physical surroundings and activities;

e)   perceptive, i.e. aware of and able to understand situations;

f)   versatile, i.e. able to readily adapt to different situations;

g)   tenacious, i.e. persistent, focused on achieving objectives;

h)   decisive, i.e. able to reach timely conclusions based on logical reasoning and analysis;

i)   self-reliant, i.e. able to act and function independently while interacting effectively with others;

j)   able to act with fortitude, i.e. able to act responsibly and ethically, even though these actions are not always popular and can sometimes result in disagreement or confrontation;

k)   organized, i.e. exhibiting effective time management, prioritization, planning and efficiency;

l)   open to improvement, i.e. willing to learn from situations;

m)   sensitive, i.e. observant and respectful to culture and diversity;

n)   collaborative, i.e. effectively interacting with others, including validation and verification team members and the client's personnel.

Annex E
(normative)

Additional requirements applicable to green bond validation, verification and AUP

E.1 General

This annex provides competence requirements for validation, verification or AUP teams (including technical experts) and independent reviewers performing validation or verification of the environmental information statement related to a green bond or green loan. It contains specific requirements related to competence.

Individuals conducting the validation, verification or AUP of green bonds shall possess a good understanding of environmental attributes and benefits related to green investments as well as a basic understanding of corporate and municipal bond financing.

E.2 Competence of teams (including technical experts) and independent reviewers

E.2.1 General

The validation or verification body shall apply the requirements of this document and ISO 14030-4 when forming verification or validation teams.

E.2.2 Relevant experience

A validation or verification team experience collectively shall cover:

a) technical criteria for the categories within the applicable taxonomy being applied for eligibility of related to the environmental objective and performance of projects, assets or supporting expenditures;

b) basic financial aspects of a bond, loan or other debt instrument (e.g. terms, conditions, restrictions);

c) basic understanding of the issuer's, borrower's or originator's process, procedures and control environment (e.g. treasury policies, debt procedures including management of unallocated funds, board approval);

d) applicable green debt instruments' programme requirements.

Annex F
(normative)

Additional requirements applicable to greenhouse gas validation, verification and AUP

F.1 General

This annex provides competence requirements for validation, verification or AUP teams (including technical experts) and independent reviewers performing validation or verification of environmental information statements related to greenhouse gases. It contains specific requirements related to competence and provides a table illustrating sector competence.

F.2 Competence

F.2.1 General

In addition to the requirements in ISO 14065:2020, Clause 7, and this document, the requirements in F.2.2 shall apply.

F.2.2 Deployment of teams

F.2.2.1 Validation/verification team expertise

A validation or verification team collectively shall have sufficient expertise to evaluate:

a) the greenhouse gas project's, organization's or product's specific greenhouse gas activity and technology;

b) implementation of greenhouse gas activities in different jurisdictions as applicable;

c) identification and selection of greenhouse gas sources, sinks or reservoirs;

d) quantification, monitoring and reporting of greenhouse gas emissions or removals including consideration of relevant sector applications;

e) situations that can affect the materiality of the greenhouse gas statement, including typical and atypical operating conditions.

A validation or a verification team collectively shall have expertise to evaluate the implications of financial, operational, contractual or other agreements that can affect the greenhouse gas project, organization or product boundaries, including any legal requirements related to the greenhouse gas statement.

F.2.2.2 Validation/verification team auditing skills

In addition to the requirements given in 6.2.7, the following requirements apply.

A validation or a verification team collectively shall have auditing skills to evaluate the greenhouse gas statement of the greenhouse gas project, organization or product, particularly to evaluate:

a) greenhouse gas information systems to determine whether the project proponent or organization has effectively identified, collected, analysed and reported on the data necessary to establish a credible greenhouse gas statement, and has systematically taken corrective actions to address any nonconformities related to requirements of the relevant greenhouse gas programme or standards;

b) the impact of the various streams of data on the materiality of greenhouse gas statements.

F.2.2.3   Additional greenhouse gas project validation team skills

In addition to the requirements given in F.2.2.1 and F.2.2.2, the validation team collectively shall have the skills to assess processes, procedures and methodologies used to:

a) select, justify and quantify the baseline scenario, including underlying assumptions;

b) determine the conservativeness of the baseline scenario;

c) define the baseline scenario and greenhouse gas project boundaries;

d) demonstrate equivalence between the type and level of activities, goods or services of the baseline scenario and the greenhouse gas project;

e) demonstrate that greenhouse gas project activities are additional to baseline scenario activities;

f) demonstrate conformity, if appropriate, to greenhouse gas programme requirements such as secondary effects (e.g. leakage) and permanence.

NOTE   ISO 14064-2 includes requirements and guidance on the principle of conservativeness and the concept of equivalence.

In addition to the requirements given in F.2.2.1 and F.2.2.2, the project validation team collectively shall have knowledge of relevant sector trends that can have an impact on the selection of the baseline scenario.

F.2.2.4   Additional greenhouse gas project verification team competence

In addition to the requirements given in F.2.2.1 and F.2.2.2, the project verification team collectively shall have the expertise appropriate to assess processes, procedures or methodologies used to:

a) evaluate consistency between the validated greenhouse gas project plan and the greenhouse gas project implementation;

b) confirm the ongoing appropriateness of the validated greenhouse gas project plan, including its baseline scenario and underlying assumptions.

F.2.2.5   Additional greenhouse gas product verification team competence

In addition to the requirements given in F.2.2.1 and F.2.2.2, the product verification team collectively shall have competence on:

— life cycle assessment methodology;

— product category rule (PCR) or product category rule for carbon footprints (CFP-PCR) applicable to the specific verification;

— structure of the database applicable to the specific verification.

F.3 Sector competence

Table F.1 provides an illustrative list of sectors and greenhouse gas (GHG) emission and removal activities. For a given validation or verification engagement, it is possible that the team needs to be competent in more than one sector. For example, for carbon capture and storage engagements, a team should be competent in sector 2 and sector 5. For a landfill site, a team should be competent in sector 1,

sector 2 (assuming the methane is combusted) and sector 6. As each engagement is unique, the applicable competence should be determined and reflected in the engagement team.

Table F.1 — Examples of sector competence

Sector	Example
1. Direct GHG emissions[a] (excluding process emissions) and indirect GHG emissions from imported energy[b]	Sector competence requires knowledge and understanding of the generation, reduction or avoidance of GHG emissions and monitoring activities associated with: — stationary or mobile combustion of fossil or renewable fuels; — production of electricity from the combustion of fossil or renewable fuels; — production of electricity and heat using cogeneration technologies; — flaring of greenhouse gases; — fugitive emissions and emissions from venting of greenhouse gases. NOTE 1 This sector includes, but is not limited to, oil and gas production, manufacturing, mining, metals production, construction, pipeline and energy generation. NOTE 2 Mobile emission sources can include, but are not limited to, emissions from aviation, road transportation, railways, marine and off-road transportation.
2. Process GHG emissions (non-combustion, chemical reaction and other)	Sector competence requires knowledge and understanding of the generation, reduction or avoidance of GHG emissions and monitoring activities associated with: — industrial processes including, but not limited to, chemical production, manufacturing, oil and gas refining, and non-combustion processes involving the avoidance, replacement, destruction, decomposition or mitigation of industrial gas emissions (HFCs, PFCs, SF_6, N_2O, ozone depleting substances, etc.); — purification processes associated with carbon capture and storage (e.g. amine solution or potassium hydroxide capture systems).
3. GHG emissions and removals from agriculture, forestry and other land use (AFOLU)	Sector competence requires knowledge and understanding of the generation, reduction, avoidance, removal or removal enhancements of GHG emissions and monitoring activities associated with: — carbon sequestration in biomass and vegetation; — estimation of rates of vegetation growth and crop yield; — precipitation/evapo-transpiration process; — biological nitrogen fixation process, crop residue nitrogen and N_2O emissions; — soil organic carbon stock. NOTE 3 This sector includes, but is not limited to, reforestation, deforestation, forest management, agriculture, croplands/soil management, grassland management, revegetation, avoided deforestation, wetlands and sediments.
4. GHG emissions from livestock	Sector competence requires knowledge and understanding of the generation, reduction or avoidance of GHG emissions and monitoring activities associated with: — livestock/enteric fermentation and its variation due to changes in its management.
5. Carbon storage in geological reservoirs	Sector competence requires knowledge and understanding of the generation, reduction or avoidance of GHG emissions and monitoring activities associated with:

Sector	Example
	— evaluation of appropriate sites for storage; — carbon storage in geological formations (e.g. reservoirs); — seepage from carbon storage (e.g. permanence).
6. GHG emissions from decomposition of waste material	Sector competence requires knowledge and understanding of the generation, reduction or avoidance of GHG emissions and monitoring activities associated with: — disposals including, but not limited to, landfills, composting facilities, wastewater treatment, manure management and other waste management processes.
[a] "Direct greenhouse gas emission" is defined in ISO 14064-1:2018, 3.1.9. [b] "Indirect greenhouse gas emissions from imported energy", see ISO 14064-1:2018, 5.2.4 b).	

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