



BSI Standards Publication

Environmental management — Requirements with guidance for verification and validation of water statements

National foreword

This British Standard is the UK implementation of ISO 14017:2022.

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Environmental management — Requirements with guidance for verification and validation of water statements

*Management environnemental — Exigences et recommandations
pour la vérification et la validation des déclarations relatives à l'eau*



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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).

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

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

This document was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 2, *Environmental auditing and related environmental investigations*.

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

0.1 Background

Water is vital for supporting life on Earth. It is important for continued health and wellbeing as well as for a sustainable economy and environment.

Water is a growing global concern. Demand for water continues to rise exponentially because of increasing population, industrial development, energy demands and agriculture. Water supplies are becoming more erratic and uncertain, and degrading water quality can add to this uncertainty. The current rate of water use is unsustainable.

Water is necessary for all ecosystems. In water-stressed countries/regions, during droughts and in areas where water resources are scarce, it is extremely important to ensure access to water supplies. As a result, water stewardship is necessary to sustain the natural water cycle, which is interlinked with the Earth's climate and ecosystems.

Organizations are beginning to evaluate water risk and potential impacts on operations. Financial institutions and investment firms are evaluating climate-change-related business risks and are factoring water risks into investment and credit ratings and in evaluation of green investments.

The importance of water issues is recognized by the United Nations (UN) and reflected in several of the UN Sustainable Development Goals (SDGs). Water management policies are important for achieving global poverty alleviation goals, facilitating climate change adaptation, and expanding international cooperation and capacity-building support in developing countries, and will require implementation of integrated water resources management at all levels, including through transboundary cooperation. Water management policies are important to ensure a sufficient and constant supply of water under increasing scarcity.

Water initiatives related to measuring and evaluation of risks rely on reliable and credible science-based information. This growing need to evaluate and manage water risks requires confidence in water information, and is resulting in a need for verification and validation of water statements.

0.2 Approach of this document

This document provides the requirements and guidance for verification and validation activity, whether used in combination or independently, that can enable a verifier or validator to issue an opinion on a water statement (or agreed-upon procedures findings) that are attributed to any organization, project or normalized unit (e.g. product). Water information that is subject to verification is historical in nature, while validation relates to the outcome of future events. User(s) of this document are responsible for determining how to apply the requirements of this document in relation to the context and type of the applicable water programme.

This document can be used by first-, second- and third-party water information verifiers and validators, which may be an individual or a body. It is regime neutral, meaning that it can be used for verifying and validating water information statements regardless of the criteria used to develop those water statements. Criteria may be based on, for example, governmental agreements, regulatory requirements, voluntary programme requirements or other compliance obligations.

This document provides requirements and guidance for performing verification and validation of water statements. It is intended to be useful to a broad range of users, including:

- first-, second- and third-party water information verifiers and validators;
- organizations and individuals involved in developing and commissioning water projects;
- organizations conducting internal verification and validation of their water statements;
- organizations involved in water information verifier or validator training;
- voluntary and mandatory water programme administrators;

- investor, finance and insurance communities;
- regulatory agencies;
- organizations involved in accreditation and conformity assessment.

Applications of this document can include but are not limited to verification and validation of:

- water projects in response to climate adaptation and mitigation measures;
- water projects implemented to meet organizational requirements for water conservation, water quality improvement, or improvements in water use efficiency;
- water projects that enhance or restore water flows to benefit critically dewatered sections of rivers, streams and wetlands and to replenish depleted groundwater supplies;
- municipal and corporate water use information;
- water footprint information based on ISO 14046;
- water information normalized by a relevant unit;
- supply chain water information;
- sustainability report water information;
- water information to support water quality credit trading schemes;
- water information as part of local/municipal, regional or national reporting.

The requirements of this document describe a process for providing assurance to intended users that an organization's or project's water statements are complete, accurate, consistent, transparent and without material discrepancies.

This document:

- describes the process and specific requirements necessary for providing confidence in the outcome of verification and validation of water information but includes considerable guidance and flexibility;
- addresses/considers accounting principles which are necessary for providing rigor and confidence in validation and verification results;
- addresses issues relating to materiality or level of assurance, where applicable;
- discusses the use of risk assessment in designing and carrying out verification and validation investigations (which is critical in designing sampling methods and plans, and in evaluating results of investigations).

The document provides specific requirements and guidance for:

- identification of purpose and intent of the engagement (e.g. verification, validation, other);
- identification and agreement on level of assurance, verification/validation criteria, materiality, scope and boundaries;
- strategic analysis to determine timing and required resources for conducting the verification or validation;
- conducting a risk assessment to facilitate development of a verification/validation plan;
- evidence gathering plan, and appropriate sampling methodologies consistent with the type of engagement, criteria for the engagement and the level of assurance required;

- conducting the verification/validation, including assessing water information and information systems and controls and related support;
- preparing water information verification and validation opinions and reporting results;
- water information verifier/validator competency requirements.

In this document, the following verbal forms are used:

- “shall” indicates a requirement;
- “should” indicates a recommendation;
- “may” indicates a permission;
- “can” indicates a possibility or a capability.

Environmental management — Requirements with guidance for verification and validation of water statements

1 Scope

This document specifies principles, requirements and guidelines for the verification and validation of water statements.

It is applicable to organizational, product and project water statement verification and validation, and can also be used to provide confidence in reported water information on a local, regional or national level.

This document is programme neutral. If a programme is applicable, requirements of that programme are additional to the requirements of this document.

NOTE Legislation can differ from jurisdiction to jurisdiction. It is the user's responsibility to determine how applicable legal requirements relate to this document.

2 Normative references

There are no normative references in this document.

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 related to water information

3.1.1

water information

information supporting a *water statement* (3.3.3) and pertaining to water characteristics important to the *intended user(s)* (3.2.3) such as accessibility to water resources, water use, *water withdrawal* (3.1.5), water degradation, water quality, water availability and water scarcity

3.1.2

water information system

policies, processes and procedures to establish, manage, maintain and record *water information* (3.1.1)

Note 1 to entry: A water information system can include measurements, spreadsheets, samples, calibration instructions, etc.

[SOURCE: ISO 14064-3:2019, 3.5.1, modified — “water” has replaced “greenhouse gas” and “GHG”.]

3.1.3

water project

activity or activities that alter the conditions of a *baseline* (3.3.1) and which cause changes to water characteristics

3.1.4

water report

report containing *water information* (3.1.1) that has been developed to meet the *requirements* (3.4.16) of *water programme* (3.2.5) or *agreed-upon procedure* (3.4.10)

3.1.5

water withdrawal

anthropogenic removal of water from any *water body* (3.1.7) or from any *drainage basin* (3.1.6), either permanently or temporarily

Note 1 to entry: The term “water abstraction” is sometimes used for this concept.

Note 2 to entry: Water withdrawal typically describes the total amount of water withdrawn from a surface water or groundwater source. Measurements of this withdrawn water can help evaluate demands from domestic, industrial and agricultural users.

[SOURCE: ISO 14046:2014, 3.2.2, modified — Note 2 to entry has been added.]

3.1.6

drainage basin

area from which direct surface runoff from precipitation drains by gravity into a stream or other *water body* (3.1.7)

Note 1 to entry: The terms “watershed”, “drainage area”, “catchment”, “catchment area” or “river basin” are sometimes used for the concept of “drainage basin”.

Note 2 to entry: Groundwater drainage basin does not necessarily correspond in area to surface drainage basin.

Note 3 to entry: The drainage area(s) within the scope of *verification* (3.4.1) or *validation* (3.4.2) and the related boundaries are normally defined in the agreement between the *verifier* (3.4.28) or *validator* (3.4.29) and the *client* (3.2.4) and may be specified in legal *requirements* (3.4.16) or water programme requirements.

[SOURCE: ISO 14046:2014, 3.1.8, modified — Note 3 to entry has been replaced.]

3.1.7

water body

entity of water with definite hydrological, hydrogeomorphological, physical, chemical and biological characteristics in a given geographical area

EXAMPLE Lakes, rivers, groundwaters, seas, icebergs, glaciers and reservoirs.

Note 1 to entry: The water body(ies) within the scope of *verification* (3.4.1) or *validation* (3.4.2) and the related boundaries are normally defined in the agreement between the *verifier* (3.4.28) or *validator* (3.4.29) and the *client* (3.2.4) and may be specified in legal *requirements* (3.4.16) or water programme requirements.

[SOURCE: ISO 14046:2014, 3.1.7 modified — Note 1 to entry has been replaced.]

3.2 Terms related to entities involved in water information verification and validation

3.2.1

organization

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

[SOURCE: ISO 14001:2015, 3.1.4, modified — Note 1 to entry has been deleted.]

3.2.2

responsible party

person or persons responsible for the provision of the *water statement* (3.3.3) and the supporting *water information* (3.1.1)

Note 1 to entry: The responsible party can be either individuals or representatives of an *organization* (3.2.1), *water project* (3.1.3) or product, and can be the party who engages the *verifier* (3.4.28) or *validator* (3.4.29).

[SOURCE: ISO 14064-3:2019, 3.2.3, modified — “water” has replaced “GHG”.]

3.2.3

intended user

individual or *organization* (3.2.1) identified by those reporting *water information* (3.1.1) as being the one who relies on that information to make decisions

Note 1 to entry: The intended user can be the *client* (3.2.4), the *responsible party* (3.2.2), *water programme* (3.2.5) administrators, regulators, investors, green bond providers, or other interested parties, such as local communities, government departments or non-governmental organizations.

[SOURCE: ISO 14064-3:2019, 3.2.4, modified — “water” has replaced “GHG”.]

3.2.4

client

organization (3.2.1) or person requesting *verification* (3.4.1) or *validation* (3.4.2)

Note 1 to entry: The client could be the *responsible party* (3.2.2), *water programme* (3.2.5) administrator or other interested party.

[SOURCE: ISO 14064-3:2019, 3.2.5, modified — “water” has replaced “GHG”.]

3.2.5

water programme

voluntary or mandatory system or scheme that develops *requirements* (3.4.16) for managing and reporting *water information* (3.1.1), and providing a *water statement* (3.3.3)

Note 1 to entry: A water programme can be at the international, national or subnational level.

Note 2 to entry: In some cases, an *organization* (3.2.1) may develop its own internal water programme.

3.3 Terms related to the water statement

3.3.1

baseline

situation resulting in quantitative and/or qualitative water characteristics that would have occurred in the absence of a *water project* (3.1.3) and which provides the *baseline scenario* (3.3.2) for comparison with water project water characteristics

[SOURCE: ISO 14064-3:2019, 3.4.6, modified — “greenhouse gas” has been deleted from the term, “situation resulting in quantitative and/or qualitative water characteristics” has replaced “quantitative reference(s) of GHG emissions and/or GHG removals”, “water project” has replaced “GHG project” and “water project water characteristics” has replaced “project GHG emissions and/or GHG removals”.]

3.3.2

baseline scenario

hypothetical reference case that best represents the conditions most likely to occur in the absence of a proposed *water project* (3.1.3)

Note 1 to entry: The baseline scenario concurs with the water project timeline.

[SOURCE: ISO 14064-3:2019, 3.4.7, modified — “water” has replaced “GHG”.]

3.3.3

water statement

factual and objective declaration regarding water characteristics and supported by *water information* (3.1.1) that provides the subject matter for the *verification* (3.4.1) or *validation* (3.4.2)

Note 1 to entry: The water statement could be presented at a point in time or could cover a period of time.

Note 2 to entry: The water statement provided by the *responsible party* (3.2.2) should be clearly identifiable, capable of consistent evaluation or measurement against suitable *criteria* (3.4.17) by a *verifier* (3.4.28) or *validator* (3.4.29).

Note 3 to entry: The water statement could be provided in a *water report* (3.1.4) or *water project* (3.1.3) plan.

[SOURCE: ISO 14064-3:2019, 3.4.3, modified — “water” has replaced “greenhouse gas” and “GHG”. “regarding water characteristics and supported by water information” has been added to the definition. Note 3 to entry has been revised.]

3.4 Terms related to verification and validation

3.4.1

verification

process for evaluating a *water statement* (3.3.3) of historical data and information to determine if the water statement is materially correct and conforms to *criteria* (3.4.17)

[SOURCE: ISO 14064-3:2019, 3.6.2, modified — “water statement” has replaced “statement” twice.]

3.4.2

validation

process for evaluating the reasonableness of the assumptions, limitations and methods that support a *water statement* (3.3.3) about the outcome of future activities

[SOURCE: ISO 14064-3:2019, 3.6.3, modified — “water statement” has replaced “statement”.]

3.4.3

verification/validation team

person or persons conducting *verification* (3.4.1) / *validation* (3.4.2) activities

Note 1 to entry: One person of the verification/validation team is appointed as the *team leader* (3.4.4).

[SOURCE: ISO 14064-3:2019, 3.2.8]

3.4.4

team leader

person who manages the *verification/validation team* (3.4.3)

[SOURCE: ISO 14066:2011, 3.1.2]

3.4.5

independent reviewer

competent person, who is not a member of the *verification/validation team* (3.4.3), who reviews the *verification* (3.4.1) or *validation* (3.4.2) activities and conclusions

Note 1 to entry: The independent reviewer may be an employee of the *organization* (3.2.1) which employs the verification/validation team.

[SOURCE: ISO 14064-3:2019, 3.2.9, modified — Note 1 to entry has been added.]

3.4.6

data trail

complete record by which *water information* (3.1.1) can be traced to the primary data

[SOURCE: ISO 14064-3:2019, 3.5.2, modified — “water” has replaced “GHG” and “primary data” has replaced “GHG source”.]

3.4.7

retracing

test (3.4.27) that uncovers errors in *water information* (3.1.1) by following *data trails* (3.4.6) back to primary data

[SOURCE: ISO 14064-3:2019, 3.2.10, modified — “water” has replaced “GHG”.]

3.4.8

tracing

test (3.4.27) that is designed to uncover errors in *water information* (3.1.1) by following primary data to water information

[SOURCE: ISO 14064-3:2019, 3.2.11, modified — “is designed to uncover” has replaced “uncovers” and “water” has replaced “GHG”.]

3.4.9

engagement

arrangement between two parties, with the terms usually specified in a contract, to perform services

[SOURCE: ISO 14064-3:2019, 3.6.1]

3.4.10

agreed-upon procedures

AUP

engagement (3.4.9) that reports on the results of *verification* (3.4.1) or *validation* (3.4.2) activities and does not provide an *opinion* (3.4.24)

[SOURCE: ISO 14064-3:2019, 3.6.4, modified — “or validation” has been added.]

3.4.11

level of assurance

degree of confidence in the *water statement* (3.3.3)

Note 1 to entry: Assurance is provided on historical information.

[SOURCE: ISO 14064-3:2019, 3.6.5, modified — “water” has replaced “GHG”.]

3.4.12

reasonable assurance

level of assurance (3.4.11) where the nature and extent of the *verification* (3.4.1) activities have been designed to provide a high but not absolute level of assurance on historical data and information

[SOURCE: ISO 14064-3:2019, 3.6.6]

3.4.13

limited assurance

level of assurance (3.4.11) where the nature and extent of the *verification* (3.4.1) activities have been designed to provide a reduced level of assurance on historical data and information

[SOURCE: ISO 14064-3:2019, 3.6.7]

3.4.14

material

information capable of influencing the decisions of *intended users* (3.2.3)

[SOURCE: ISO 14064-3:2019, 3.6.8]

3.4.15

materiality

concept that individual *misstatements* ([3.4.21](#)) or the aggregation of misstatements could influence the *intended users'* ([3.2.3](#)) decisions

[SOURCE: ISO 14064-3:2019, 3.6.9]

3.4.16

requirement

need or expectation that is stated, generally implied or obligatory

[SOURCE: ISO 14050:2020, 3.1.15]

3.4.17

criteria

policy, procedure or other *requirement* ([3.4.16](#)) used as a reference against which the *water statement* ([3.3.3](#)) is compared

[SOURCE: ISO 14064-3:2019, 3.6.10, modified — “water” has replaced “GHG”.]

3.4.18

controls

responsible party's ([3.2.2](#)) policies and procedures that help ensure that the *water statement* ([3.3.3](#)) is free from *material misstatements* ([3.4.23](#)) and conforms to the *criteria* ([3.4.17](#))

[SOURCE: ISO 14064-3:2019, 3.6.11, modified — “water” has replaced “GHG”.]

3.4.19

site

location where an *organization* ([3.2.1](#)) carries out work or a service

Note 1 to entry: A site may include one or several *facilities* ([3.4.20](#)).

[SOURCE: ISO 14064-3:2019, 3.6.13]

3.4.20

facility

single installation, set of installations or production processes (stationary or mobile), which can be defined within a single geographical boundary, organizational unit or production process

[SOURCE: ISO 14064-3:2019, 3.6.14]

3.4.21

misstatement

errors, omissions, misreporting or misrepresentations in the *water statement* ([3.3.3](#))

[SOURCE: ISO 14064-3:2019, 3.6.15, modified — “water” has replaced “GHG”.]

3.4.22

uncertainty

parameter associated with the result of quantification that characterizes the dispersion of the values that could be reasonably attributed to the quantified amount

Note 1 to entry: Uncertainty information typically specifies quantitative estimates of the likely dispersion of values and a qualitative description of the likely causes of the dispersion.

[SOURCE: ISO 14064-3:2019, 3.6.16]

3.4.23

material misstatement

individual *misstatement* (3.4.21) or the aggregate of actual misstatements in the *water statement* (3.3.3) that could affect the decisions of the *intended users* (3.2.3)

[SOURCE: ISO 14064-3:2019, 3.6.17, modified — “water” has replaced “GHG”.]

3.4.24

opinion

formal written declaration provided by the *verifier* (3.4.28) or *validator* (3.4.29) to the *intended user* (3.2.3) that provides confidence on the *water statement* (3.3.3) in the *responsible party's* (3.2.2) *water report* (3.1.4) and confirms conformity with the *criteria* (3.4.17)

[SOURCE: ISO 14064-3:2019, 3.6.18, modified — “verification/validation” has been deleted from the term, “provided by the verifier or validator” had been added and “water” has replaced “GHG”.]

3.4.25

nonconformity

non-fulfilment of a *requirement* (3.4.16)

[SOURCE: ISO 14050:2020, 3.1.17]

3.4.26

analytical procedure

evaluation of *water information* (3.1.1) made by an analysis of plausible relationships between water information and non-water data

Note 1 to entry: Analytical procedures evaluate relationships between water information and other data to identify inconsistencies.

[SOURCE: ISO 14064-3:2019, 3.6.20, modified — “water” has replaced “GHG” and Note 1 to entry has been added.]

3.4.27

test

technique used to assess a characteristic of items in a sampled population of *water information* (3.1.1) against *verification* (3.4.1) or *validation* (3.4.2) *criteria* (3.4.17)

[SOURCE: ISO 14064-3:2019, 3.6.21, modified — “water information” has replaced “GHG data and information”.]

3.4.28

verifier

competent and impartial person with responsibility for performing and reporting on a *verification* (3.4.1)

[SOURCE: ISO 14064-3:2019, 3.2.6]

3.4.29

validator

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

[SOURCE: ISO 14064-3:2019, 3.2.7]

3.4.30

inherent risk

susceptibility of an assertion to a *material misstatement* (3.4.23) assuming that there are no related *controls* (3.4.18)

Note 1 to entry: Inherent risk is higher where an assertion is based on complex calculations and lower where an assertion is based on simple calculations. Similarly, inherent risk is higher where an assertion is based on estimates and lower where an assertion is based on factual data.

3.4.31

control risk

likelihood that the *controls* (3.4.18) of the *organization* (3.2.1) will not prevent or detect a *material* (3.4.14) discrepancy

Note 1 to entry: This risk is a function of the effectiveness of the design and operation of internal controls relating to *water information* (3.1.1).

Note 2 to entry: Control risk is high where data providing the basis for an assertion are manually transcribed and low where data are automatically obtained from measuring equipment and input into a computer database electronically. Some control risk will always exist because of inherent limitations on internal controls.

3.4.32

detection risk

likelihood that the *verifier* (3.4.28) will not detect a *material* (3.4.14) discrepancy that has not been corrected by the *controls* (3.4.18) of the *organization* (3.2.1)

Note 1 to entry: Detection risk is a function of the effectiveness of the evidence gathering procedure and its application by the verifier.

Note 2 to entry: Detection risk cannot be reduced to zero because the verifier usually does not examine all *water information* (3.1.1) in an area and because of other factors such as the possibility that the verifier selects an inappropriate evidence gathering procedure, misapply an appropriate evidence gathering method, or misinterpret the evidence gathering results. These other factors may be addressed through adequate planning, proper assignment of competent personnel, application of professional scepticism, and adequate supervision and review of the work performed. Detection risk relates to the nature, timing and extent of evidence gathering procedures that are determined by the verifier to reduce the risk that *material misstatements* (3.4.23) are not detected to an acceptably low level.

Note 3 to entry: For a given level of verification risk, the acceptable level of detection risk has an inverse relationship to the assessment of the risk of material misstatements. The higher the risk of material misstatement, the lower the level of detection risk that can be accepted.

Note 4 to entry: As well as the risk of the verifier drawing a positive conclusion when *nonconformities* (3.4.25) exist, there is also a risk of the verifier drawing a negative conclusion where no nonconformities exist.

3.4.33

professional scepticism

attitude that includes a questioning mind and a critical assessment of evidence

Note 1 to entry: Further information on professional scepticism can be found in ISAE 3000.

[SOURCE: ISO 14066:2011, 3.1.3, modified — Note 1 to entry has been replaced.]

3.4.34

competence

ability to apply knowledge and skills to achieve intended results

Note 1 to entry: Ability implies exhibiting appropriate personal behaviour when conducting the *verification* (3.4.1) or *validation* (3.4.2).

Note 2 to entry: When defining competence, the following meanings have been applied to the words used:

- knowledge refers to facts and methods, i.e. to know;
- skills mean to carry out in practice, i.e. to do.

Note 3 to entry: This document uses the term “competence” instead of “competency”. The meanings of the terms are differentiated as follows:

- competence is defined as the broad range of knowledge, skills, attitudes and observable behaviour that together comprise the ability to deliver a specified professional service; it also involves adoption of a professional approach that values accountability to the public and leadership in professional practice, the public sector, the corporate sector and education;

- competency is defined as the particular tasks that competent personnel perform while applying, or bringing to bear, the pervasive qualities and skills that are characteristic of competent personnel to the level of proficiency defined as appropriate by the profession.

[SOURCE: ISO 14066:2011, 3.1.4, modified — Note 2 to entry has been deleted and the subsequent notes renumbered.]

3.4.35

technical expert

person who provides specific knowledge or expertise to the *verification/validation team* ([3.4.3](#))

Note 1 to entry: Specific knowledge or expertise is that which relates to the *organization* ([3.2.1](#)), the *water project* ([3.1.3](#)) to be verified or validated, or language or culture.

Note 2 to entry: A technical expert does not act as a *verifier* ([3.4.28](#)) or *validator* ([3.4.29](#)) in the verification/validation team.

[SOURCE: ISO 14066:2011, 3.3.6, modified — Note 3 to entry has been deleted.]

3.4.36

sensitivity

likelihood that the outcome of a study will significantly change based on changes to input variables and methodologies used in the study

4 Principles

4.1 General

The application of principles is fundamental to ensure that water information is a true and fair account. The principles are the basis for, and will guide the application of, the requirements in this document.

4.2 Impartiality

The verification/validation is objective and does not introduce bias.

4.3 Evidence-based approach

The verification/validation engagement employs a rational method for reaching reliable and reproducible verification/validation conclusions and is based on sufficient and appropriate evidence.

4.4 Fair presentation

The verification/validation activities, findings, conclusions and opinions are truthfully and fairly presented. Significant obstacles encountered during the process, as well as unresolved, diverging opinions among verifiers or validators, are reported to the responsible party and the client.

4.5 Documentation

The verification/validation is documented and establishes the basis for the conclusion and conformity with the criteria.

4.6 Conservativeness

When assessing comparable alternatives, a selection that is cautiously moderate is used.

NOTE For further details on conservativeness, see [Clause B.8](#).

5 Requirements applicable to verification/validation

5.1 Pre-engagement activities

5.1.1 General

The verifier/validator shall confirm the following aspects of the engagement:

- a) type (see [5.1.2](#));
- b) level of assurance applicable to verification only (see [5.1.3](#));
- c) objectives (see [5.1.4](#));
- d) criteria (see [5.1.5](#));
- e) scope (see [5.1.6](#));
- f) materiality thresholds (see [5.1.7](#));
- g) language (see [5.1.8](#)).

Engagement types specified in this document include verification and validation. [Annex C](#) describes an engagement type called “agreed-upon procedures” and contains requirements that shall be followed.

Agreement on the engagement with the client can require ensuring appropriate approvals for access to facilities, personnel, databases and other sources of information relevant to the verification or validation.

5.1.2 Type of engagement

The verifier/validator and the client shall agree on the engagement type(s) and shall consider the needs of the intended user. The verifier/validator shall assess the appropriateness of the proposed engagement type.

The agreement shall consider confidentiality requirements for the engagement, if any.

A verifier/validator can conduct a mixed engagement, as described in [Annex D](#), when:

- a) the scope of each type of engagements is clearly defined;
- b) the water statements are developed in accordance with criteria.

NOTE The specific confidentiality requirements will vary depending on whether the engagement is first, second or third party.

5.1.3 Level of assurance in the case of verification

For verification, the verifier and the client shall agree on the level of assurance to be applied and shall consider the needs of the intended user. The verifier shall assess the appropriateness of the level of assurance. The verifier shall not change the level of assurance during the verification, but may terminate the engagement and start a new engagement with a different level of assurance. The level of assurance shall be specified prior to the start of the verification because the level of assurance establishes the nature, extent and timing (the design) of the evidence-gathering activities.

This document describes requirements applicable for verification at a reasonable level of assurance. In cases of limited level of assurance, the requirements in [Annex A](#) shall be met.

Considerations for verification are given in [Annex B](#).

5.1.4 Objectives

The verifier/validator and client shall agree on the verification/validation objectives at the beginning of the verification/validation engagement.

Verification objectives shall include evaluation of the water statement for conformance to applicable criteria including levels of assurance and materiality.

Validation objectives shall include an assessment of the likelihood that implementation of the water-related activities will result in the achievement of outcomes as stated by the responsible party.

5.1.5 Criteria

The verifier/validator and client shall agree on the criteria taking into account the principles and requirements of the standards or water programme to which the responsible party subscribes. The verifier/validator shall assess the suitability of the criteria proposed by the client, considering:

- a) the method for determining engagement scope and boundaries;
- b) the water information to be accounted for;
- c) applicable water programme requirements.

Criteria shall be relevant, complete, reliable and understandable. It shall be available to the intended user. The criteria shall be referenced in the opinion.

5.1.6 Scope

The verifier/validator and client shall agree on the verification/validation scope at the beginning of the verification/validation process. The scope, as a minimum, shall include the following:

- a) boundaries;
- b) facilities, physical infrastructure, activities, technologies, processes and reporting units as applicable;
- c) types of water (if applicable);
- d) time period;
- e) baselines and baseline scenarios, as applicable.

5.1.7 Materiality thresholds

The verifier/validator shall confirm the materiality threshold required by the intended users. If no materiality threshold has been specified by intended users, the verifier/validator shall set (a) materiality threshold(s) and communicate them to the client.

NOTE 1 The water programme can establish a threshold for materiality.

NOTE 2 Materiality has qualitative and quantitative components. Quantitative materiality refers to error in value in the water statement. Examples include misstatements, incomplete inventories, misclassified water information or misapplication of calculations. Qualitative materiality refers to intangible issues that affect the water statement. Examples include:

- a) control issues that erode the verifier's confidence in the reported water information;
- b) poorly managed documented information;
- c) difficulty in locating requested information;
- d) noncompliance with regulations related to the water statement.

NOTE 3 The concept of materiality is used in designing the verification/validation and in assessing the evidence to come to a conclusion.

5.1.8 Language

The verifier/validator shall confirm with the client on the language to be used during the verification/validation.

5.2 Verification/validation team selection

A team shall be selected that has the necessary competence to undertake the verification/validation in accordance with [Annex E](#).

NOTE [Annexes F to J](#) provide additional information regarding verifier/validator competency.

5.3 Verification/validation activities and techniques

Verifiers/validators shall employ the following evidence-gathering activities and techniques in the verification/validation as applicable to the engagement:

- a) observation;
- b) inquiry;
- c) analytical testing;
- d) confirmation;
- e) recalculation;
- f) examination;
- g) retracing;
- h) tracing;
- i) control testing;
- j) sampling;
- k) estimate testing;
- l) cross-checking;
- m) reconciliation.

5.4 Specific requirements

5.4.1 Verifier/validator communication

The verifier/validator, as soon as practicable, shall communicate requests for clarification, material misstatements and nonconformities to the responsible party. If there is a material adjustment to be made to the water statement, the verifier/validator shall communicate the need for the adjustment to the responsible party.

If, in the verifier's/validator's judgement, the responsible party does not respond appropriately within a reasonable period, the verifier/validator shall inform the client, if different from the responsible party.

If, in the verifier's/validator's judgement, the client does not respond appropriately within a reasonable period, the verifier/validator shall:

- a) issue a modified or adverse verification/validation opinion; or
- b) withdraw from the verification/validation.

The verifier/validator should communicate non-material misstatements to the responsible party.

5.4.2 Sufficiency of evidence

If the verifier/validator determines that there is insufficient information to support the water statement, the verifier/validator shall request additional information. If sufficient information cannot be obtained and the information is necessary for the verifier/validator to form a conclusion, the verifier/validator shall not proceed with the verification/validation and shall disclaim the issuance of an opinion.

5.4.3 Intentional misstatement

If a matter comes to the verifier's/validator's attention that causes the verifier/validator to believe in the existence of intentional misstatement or noncompliance by the responsible party with laws and regulations, the verifier/validator shall communicate the matter to the appropriate parties as soon as practicable.

5.4.4 Documented information

The verifier/validator shall maintain the following documented information:

- a) engagement terms;
- b) risks identified and mitigation action;
- c) verification/validation plan;
- d) evidence-gathering plan;
- e) who performed the evidence-gathering activities and when they were performed;
- f) reference to objective evidence supporting conclusions;
- g) requests for clarification, material misstatements, nonconformities, and relevant non-material misstatements arising from the verification/validation and the conclusions reached;
- h) communication with the responsible party on material misstatements;
- i) the conclusions reached and opinions by the verifier/validator;
- j) the name of the independent reviewer, the date of review and comments of the reviewer;
- k) other documented information necessary to demonstrate conformity with this document.

5.4.5 Process for completing a verification/validation

The process for completing a verification of a water statement based on the requirements in [Clause 6](#) is shown in [Figure J.1](#).

The process for completing a validation of water information based on the requirements in [Clause 7](#) is shown in [Figure J.2](#).