



Secretariat: Canada (SCC)  
Secretary: A. Hussein

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November 10, 2003

**Subject: Circulation of Committee Draft 1 of ISO 14064 Greenhouse Gases Part 3**

Dear Sir/Madam:

I am pleased to send you for comment, the first Committee Draft of *ISO 14064: Greenhouse gases - Part 3: Specification with guidance for validation, verification and certification*. Please return comments using the ISO comments template no later than February 10, 2004 to the ISO TC207 Working Group 5 on Climate Change Secretary Kevin Boehmer ([kevin.boehmer@csa.ca](mailto:kevin.boehmer@csa.ca)).

ISO TC207 Working Group 5 on Climate Change has scheduled a meeting from March 8 to 12, 2004 in the United Kingdom to discuss and resolve Committee Draft comments. The Convenor of ISO TC207 Working Group 5, Dr. Chan Kook Weng, would like to sincerely thank all experts who have contributed to the development of the attached Committee Draft.

Yours Sincerely,

Ahmad Hussein  
ISO TC207 Secretary



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**ISO/TC 207 / SC**

Title

**ISO TC 207 on Environmental Management Working Group 5 on Climate Change**

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[date]

(P-members vote only: ballot form attached)

**P-members of the technical committee or subcommittee concerned have an obligation to vote.**

*English title*

**ISO 14064: Greenhouse gases - Part 3: Specification with guidance for validation, verification and certification**

*French title*

**ISO 14064: Gaz à effet de serre - Partie 3: Spécifications avec lignes directrices pour la validation, la vérification et certification**

Reference language version:     English     French     Russian

Introductory note

Attached for comment is Committee Draft 3 of ISO 14064 Part 1. Please prepare and return separate comments tables for each Part of the draft Standard.

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9 **Greenhouse gases - Part 3: Specification with guidance**  
10 **for validation, verification and certification**

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74 **Foreword**

75

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

84

85 International Standards are drafted in accordance with the rules given in the ISO/IEC  
86 Directives, part 3.

87

88 The main task of technical committees is to prepare International Standards. Draft  
89 International Standards accepted by the technical committees are circulated to the  
90 member bodies for voting. Publication as an International Standard requires approval by  
91 at least 75 % of the members casting a vote.

92

93 Attention is drawn to the possibility that some of the elements of this International  
94 Standard may be the subject of patent rights. ISO shall not be held responsible for  
95 identifying any or all such patent rights.

96

97 ISO 14064-3 was prepared by Technical Committee ISO/TC 207, Environmental  
98 management, Working Group 5 on Climate Change.

99

100

## 100 **Introduction**

101

102 Climate change has been identified as one of the greatest challenges facing nations,  
103 governments, business and citizens over upcoming decades. Climate change has  
104 implications for a number of earth's systems; natural, human and economic and could  
105 lead to significant changes in resource use, production and economic activity. In  
106 response, international, national, regional and local initiatives are being developed and  
107 implemented to limit the growth of greenhouse gas (GHG) concentrations in the Earth's  
108 atmosphere. Many GHG initiatives rely on the quantification, monitoring, reporting and  
109 verification of GHG emissions and/or removals.

110

111 *ISO 14064 Greenhouse gases* is comprised of three Parts:

- 112 • *ISO 14064 Greenhouse gases – Part 1: Specification for the quantification,*  
113 *monitoring and reporting of organization emissions and removals;*
- 114 • *ISO 14064 Greenhouse gases - Part 2: Specification for the quantification,*  
115 *monitoring and reporting of project emissions and removals;*
- 116 • *ISO 14064 Greenhouse gases - Part 3: Specification and guidance for*  
117 *validation, verification and certification.*

118

119 This International Standard is expected to benefit entities, governments, project  
120 proponents and stakeholders worldwide by providing clarity and consistency for  
121 quantifying, monitoring, reporting and verifying greenhouse gases. Specifically, this  
122 standard will:

- 123 • Enhance the environmental integrity of GHG quantification;
- 124 • Enhance the credibility, consistency, and transparency of GHG accounting and  
125 reporting, including GHG project emission reductions and removal  
126 enhancements;
- 127 • Facilitate the development and implementation of organization GHG  
128 management strategies and plans;
- 129 • Facilitate the development and implementation of GHG projects;
- 130 • Allow entities to track performance and progress in the reduction of GHG  
131 emissions and/or increase in GHG removals;
- 132 • Assist in the identification of GHG risks or liabilities;
- 133 • Increase investor confidence;
- 134 • Facilitate the crediting and trade of GHG emission reductions or removal  
135 enhancements.

136

137 Users of this International Standard may find benefit in some of the following  
138 applications:

- 139 • Corporate risk management; for example, the identification and management of  
140 GHG-related liabilities and assets;
- 141 • Voluntary initiatives; for example, participation in voluntary GHG registry or  
142 reporting initiatives;
- 143 • GHG markets; for example, the buying and selling of GHG allowances or credits;
- 144 • Regulatory/government reporting; for example, credit for early action or national  
145 reporting/inventory schemes.

146

147 *ISO 14064 Greenhouse gases - Part 3: Specification and guidance for validation,*  
148 *verification and certification* provides principles, requirements and guidance for those  
149 conducting GHG information validation and verification, as well as on the competence,  
150 selection and ongoing professional evaluation of validators and verifiers. It is intended to  
151 be useful to a broad range of potential users, including:

- 152 • GHG validators and verifiers;
- 153 • Organizations implementing GHG management programmes;
- 154 • Organizations and individuals involved in developing and commissioning GHG  
155 projects;
- 156 • Organizations needing to conduct internal audits of their GHG information;
- 157 • Organizations involved in GHG validator or verifier training;
- 158 • Voluntary and mandatory GHG scheme administrators;
- 159 • Investor, finance and insurance communities;
- 160 • Regulators and those involved in the accreditation and conformity assessment of  
161 GHG management, emissions trading and emission or removal offset  
162 programmes.

163  
164 The requirements in this International Standard describe a process for providing  
165 assurance to all stakeholders that an organization's or GHG project's assertion(s) are  
166 complete, accurate, consistent, transparent and free from any material misstatements.  
167 The process of validation and verification are similar; however, there are certain  
168 activities where there are differences.

169  
170 Clause 4 describes the principles and fundamentals of validation and verification. These  
171 help the user to appreciate the essential nature of validation and verification and they  
172 are a necessary prelude to Clause 5 requirements for conducting the validation of GHG  
173 projects and the verification of organizations or GHG projects. Clause 5 covers such  
174 issues as assigning responsibility for managing the validation or verification process,  
175 establishing the validation or verification objectives, criteria and scope (including the  
176 level of assurance required), coordinating validation or verification activities, conducting  
177 a strategic review of an organization's or GHG project's GHG information, establishing  
178 appropriate sampling regimes for the validation and verification of GHG information and  
179 the testing of the organization's or GHG project's control environments. This clause also  
180 provides requirements for the drafting and communication of the validation or verification  
181 statement.

182  
183 The guidance contained in the informative annexes to this International Standard  
184 provides additional information for validation and verification under a range of GHG  
185 schemes or conditions. Annex A provides guidance on the validation and verification  
186 requirements contained in Clause 5 of this International Standard. Annex A is  
187 informative and does not include mandatory requirements. Guidance notes are  
188 numbered consistent with respective clauses contained within Clause 5. Annex B  
189 provides guidance on the skills and competencies required of validators and verifiers to  
190 effectively conduct validation and verification requirements contained in Clause 5 of this  
191 International Standard. Annex B is informative and does not include mandatory  
192 requirements. Annex C contains a list of useful publications that may assist GHG  
193 validators or verifiers in the conduct of their duties.

194

195 **Greenhouse gases - Part 3: Specification and guidance for**  
196 **validation, verification and certification**  
197

198 **1.0 Scope**

199 This International Standard specifies requirements and provides guidance for those  
200 conducting or managing GHG information validation and/or verification. Guidance is  
201 also provided for identifying appropriate skills and competences of GHG validators and  
202 verifiers. This International Standard may be applied to organizational or GHG project  
203 quantification, including GHG quantification, monitoring and reporting carried out in  
204 accordance with Parts 1 and 2 of this International Standard.  
205

206 This International Standard is GHG policy and scheme neutral. Where a GHG policy or  
207 scheme is applicable, the requirements of that policy or scheme shall be additional to the  
208 requirements of this International Standard. Where a requirement of this International  
209 Standard prevents an organization or GHG project proponent from complying with  
210 applicable GHG policy or scheme requirements, the requirement of the GHG policy or  
211 scheme shall take precedence.  
212  
213

214 **2.0 Normative references**

215  
216 The following referenced documents are indispensable for the application of this  
217 document. For dated references, only the edition cited applies. For undated references,  
218 the latest edition of the referenced document (including any amendments) applies.  
219

220 *ISO 14064: 200x, Greenhouse gases – Part 1: Specification for the quantification,*  
221 *monitoring and reporting of organization-level emissions and removals*  
222

223 *ISO 14064: 200x, Greenhouse gases – Part 2: Specification for the quantification,*  
224 *monitoring and reporting of project emissions and removals*  
225

226 *ISO 19011: 2002, Guidelines for quality and/or environmental management systems*  
227 *auditing*  
228  
229

230 **3.0 Definitions**

231 For the purposes of this document, the following terms and definitions apply.  
232

233 **3.1 analytical testing**

234 procedures identifying inconsistent relevant relationships or deviations from predictable  
235 amounts  
236

237 NOTE - Testing may analyze significant ratios and trends, including the resulting  
238 investigation of fluctuations.

239 **3.2 base year**

240 a historic datum for comparing GHG emissions or removals over time

241

242 NOTE – Base year emissions or removals could be quantified based on a specific year  
243 or averaged from several years

244

245 **3.3 baseline**

246 most appropriate and best estimate of GHG emissions and removals that would have  
247 occurred in the absence of the project

248

249 NOTE – The baseline is a combination of the baseline scenario, which generally  
250 includes a qualitative assessment to justify the most appropriate baseline, and baseline  
251 procedures, which generally includes methodologies to quantify GHG emissions and  
252 removals attributable to the baseline.

253

254 **3.4 carbon dioxide equivalent (CO<sub>2</sub>-e)**

255 unit for comparing the radiative forcing of a GHG to carbon dioxide

256

257 NOTE - Generally calculated using the quantity of a given GHG multiplied by its global  
258 warming potential

259

260 **3.5 control environment**

261 direction and guidance derived from general commitment, responsibility, awareness and  
262 actions of directors and management regarding the internal control system and its  
263 importance in reporting the GHG information and supporting the GHG assertion

264

265 **3.6 control procedures**

266 GHG information management system procedures to prevent, detect and correct GHG  
267 information errors

268

269 NOTE – GHG information management system procedures are implemented by  
270 management.

271

272 **3.7 facility**

273 single installation, or set of installations, stationary or mobile, that can be defined within  
274 a single geographical boundary, organizational unit or production process

275

276 NOTE - Typically a distinct production site, individual unit or series of processes at a  
277 specific location

278

279 **3.8 greenhouse gas (GHG)**

280 any gaseous constituent of the atmosphere that absorb and re-emit infrared radiation

281

282 NOTE – Common GHGs include Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous oxide  
283 (N<sub>2</sub>O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride  
284 (SF<sub>6</sub>)  
285

### 286 **3.9 GHG assertion**

287 declaration or factual and objective statement of performance made by the responsible  
288 party  
289

290 NOTE 1 - A GHG assertion can be a statement about different aspects of performance,  
291 such as:

- 292 • Quantification of GHG emissions, removals, emissions reductions or removal  
293 enhancements;
- 294 • Comparison to a base year;
- 295 • Conformity with the requirements of ISO 14064.1 or ISO 14064.2;
- 296 • Compliance with the principles and requirements of regulatory regimes or GHG  
297 schemes;
- 298 • The performance or effectiveness of internal systems and processes;
- 299 • Statements about the reliability of corporate governance processes and legal and  
300 regulatory compliance systems.

301  
302 NOTE 2 - The GHG assertion may be presented at a point in time or may cover a period  
303 of time.  
304

305 NOTE 3 - The GHG assertion provided by the responsible party must be clearly  
306 identifiable, capable of consistent evaluation or measurement against suitable criteria  
307 and in a form that can be subjected to testing methodologies for gathering evidence to  
308 support that evaluation or measurement.  
309

310 NOTE 4 - The GHG assertion is sometimes provided in the form of a GHG report.  
311

### 312 **3.10 GHG source**

313 process or mechanism that releases GHG into the atmosphere  
314

### 315 **3.11 GHG sink**

316 process or mechanism that absorbs GHG from the atmosphere or that captures and  
317 stores a GHG from an emission source  
318

### 319 **3.12 GHG emissions**

320 release of GHGs to the atmosphere by GHG sources  
321

322 NOTE – GHG emissions may be captured from a GHG source and stored in a GHG  
323 sink.  
324

### 325 **3.13 GHG removals**

326 absorption of GHGs from the atmosphere by biological GHG sinks

327 **3.14 GHG emission or removal factor**

328 factor relating activity data to absolute GHG emissions or removals  
329

330 **3.15 GHG emission reduction**

331 difference (decrease) of GHG emissions between a baseline and project  
332

333 **3.16 GHG removal enhancement**

334 difference (increase) of GHG removals between a baseline and project  
335

336 **3.17 GHG information management system**

337 policies, processes and procedures to monitor, gather, collate, transfer, process,  
338 analyse, aggregate (or disaggregate), adjust and store GHG information  
339

340 **3.18 GHG inventory**

341 detailed list of an organization's GHG sources, sinks, emissions, removals, emission  
342 reductions and removal enhancements quantified in accordance with ISO 14064 Part 1  
343

344 **3.19 GHG project**

345 project that intends to cause GHG emission reductions and/or GHG removal  
346 enhancements  
347

348 NOTE – A GHG project occurs within a finite spatial and temporal boundary.  
349

350 **3.20 GHG project proponent**

351 individual or organization that controls and has responsibility for the GHG project  
352

353 **3.21 GHG report**

354 self-contained document (in printed or electronic form) prepared in accordance with ISO  
355 14064 Part 1 or Part 2 intended to communicate the organization's or project's GHG  
356 emissions, removals, emission reductions or removal enhancements during a specified  
357 period of time and other related issues to its intended users  
358

359 **3.22 GHG scheme**

360 voluntary or mandatory international, national, sub-national governmental or non-  
361 governmental policy or regulatory authority that registers, accounts or manages GHG  
362 emissions or removals  
363

364 **3.23 global warming potential (GWP)**

365 factor describing the radiative forcing impact of one unit of a given GHG relative to one  
366 unit of carbon dioxide  
367

368 **3.24 internal control system**

369 combination of control environment, GHG information management system, and control  
370 procedures adopted by the management of an organization or project  
371

372 NOTE – The internal control system is established to ensure that the GHG assertion is  
373 reported in conformance with ISO 14064 and/or the GHG scheme.  
374

375 **3.25 level of assurance**

376 degree to which validation or verification conclusions are free from material  
377 misstatement  
378

379 NOTE – The degree depends on validator or verifier confidence that the GHG assertion,  
380 taken as a whole, is free from material misstatement  
381

382 **3.26 materiality**

383 professional judgment that the GHG assertion will reasonably influence the intended  
384 users decisions  
385

386 NOTE 1 – The professional judgment of the validator or verifier is based on whether one  
387 or more omissions, misrepresentations or errors effects the GHG assertion.  
388

389 NOTE 2 - The concept of materiality is also used when designing the validation or  
390 verification plan in determining the type of substantive processes to use to ensure that  
391 the detection risk is minimized  
392

393 **3.27 monitoring**

394 assessment of GHG emissions and removals  
395

396 NOTE – Assessments can be continuous or periodic and could include assessment of  
397 inputs or outputs of GHG sources and sinks and/or the general conditions that may  
398 influence GHG emissions and removals  
399

400 **3.28 organization**

401 company, corporation, firm, enterprise, authority or institution, or part or combination  
402 thereof, whether incorporated or not, public or private, that has its own functions and  
403 administration  
404

405 [ISO 14001:1996]  
406

407 **3.29 responsible party**

408 person or persons responsible for the provision of the GHG assertion and the supporting  
409 GHG information  
410

411 NOTE – The responsible party can be either individuals or representatives of an  
412 organization or project and may or may not be the party who engages the validation or

413 verification body. The validation or verification body may be engaged by the client or by  
414 other parties, such as the GHG scheme administrator.  
415

416 **3.30 stakeholder**

417 individual or group concerned with, affected, or likely to be affected by the activities of  
418 the organization or project  
419

420 **3.31 strategic review**

421 preliminary assessment risk  
422

423 NOTE – Typically the strategic review is conducted to assess control risk and inherent  
424 risk to determine the appropriate detection risk to accept for the GHG assertion and to  
425 determine the nature, timing and extent of substantive procedures for such assertions.  
426

427 **3.32 substantive procedure**

428 test performed to obtain evidence to detect material misstatements in the GHG assertion  
429

430 **3.33 validation**

431 systematic, impartial and documented process for the evaluation of a proposed GHG  
432 project against suitable validation criteria on the basis of the project master plan  
433

434 NOTE - Validation occurs before the implementation of the project  
435

436 **3.34 validation or verification body**

437 [second or] third party engaged by the client to undertake the validation or verification  
438

439 NOTE – The validation or verification body should be duly qualified, competent and  
440 impartial.  
441

442 **3.35 validation or verification report**

443 optional report that may be of interest to the responsible party.  
444

445 NOTE - The validation or verification report issued by the validator or verifier on matters  
446 identified during the validation or verification is a by-product of the validation or  
447 verification and is a derivative communication. It is not part of the process of obtaining  
448 sufficient appropriate evidence to support the content of the validation or verification  
449 statement on the GHG assertion.  
450

451 **3.36 validation or verification statement**

452 formal written declaration providing assurance that the responsible party's GHG  
453 assertion did occur  
454

455 NOTE - Declaration by the validation or verification body may cover claimed GHG  
456 emissions, removals, emission reductions or removal enhancements.

457 **3.37 validator**

458 competent validation team with responsibility for performing, and reporting on the results  
459 of, a validation

460

461 NOTE - This term can be used to refer to the validation body.

462

463 **3.38 verification**

464 systematic, impartial and documented periodic review and/or determination by the  
465 verification body of the reported GHG emissions, removals, emission reductions or  
466 removal enhancements

467

468 **3.39 verifier**

469 competent verification team with responsibility for performing and reporting on the  
470 verification process

471

472 NOTE - This term can be used to refer to the verification body.

473

474

475 **4.0 Principles**

476 GHG information validation and/or verification is based on a number of principles to  
477 ensure that:

- 478 • Reported data, information and related disclosures are free from material  
479 misstatement, avoid bias in their selection and presentation and provide a  
480 credible and balanced account;
- 481 • Reported data, information and related disclosures are capable of being  
482 depended upon by intended users to represent faithfully that which they either  
483 purport to represent or could reasonably be expected to represent;
- 484 • GHG information validation and verification processes use generally recognized  
485 methods to enable meaningful comparison between reported validation and  
486 verification conclusions;
- 487 • GHG validation and verification conclusions are relevant and sufficient to enable  
488 validators and verifiers working independently from one another to reach similar  
489 conclusions in similar circumstances;
- 490 • GHG validation reports and validation or verification statements take account of  
491 the needs of intended users, describes the validation or verification activities  
492 undertaken and the level of assurance provided.

493

494 The validation or verification team shall apply the following principles in validating or  
495 verifying GHG information:

496 a) Consistency: Ensure that GHG information validation and verification activities  
497 are comparable over time. Clearly justify any changes to the basis of validation  
498 or verification activities and the consequences of such changes.

499 b) Transparency: Present the validation or verification conclusion in a clear, factual,  
500 neutral and coherent manner cognizant of the needs and backgrounds of the  
501 intended users of the GHG information. Issue the validation or verification  
502 statement and conclusions in a timely manner after the validation or verification

- 503 activities have occurred. Obtain, record, compile, analyse, document and report  
504 GHG information, assumptions, references, quantification methodologies and  
505 objective evidence gathered during a validation or verification, in support of  
506 validation or verification conclusions, in a manner that can be replicated by  
507 another party.
- 508 c) Independence: Be independent of the activity being validated or verified and free  
509 from bias and conflict of interest. Maintain an objective state of mind throughout  
510 the validation or verification to ensure that the findings and conclusions will be  
511 based only on objective evidence generated during the validation or verification.
  - 512 d) Ethical conduct: Demonstrate ethical conduct through trust, integrity,  
513 confidentiality and discretion throughout the validation or verification process.
  - 514 e) Fair presentation: Reflect truthfully and accurately validation or verification  
515 activities, findings, conclusions and reports. Report significant obstacles  
516 encountered during the validation or verification process and unresolved,  
517 diverging opinions between the validation or verification team, the responsible  
518 party and the client.
  - 519 f) Due professional care: Exercise due professional care and judgment in  
520 accordance with the importance of the task performed and the confidence placed  
521 by clients and other stakeholders. Have the necessary skills and competences to  
522 undertake the validation or verification.

523  
524 NOTE - The principles of independence, ethical conduct, fair presentation and due  
525 professional care are derived from ISO 19011:2002, *Guidelines for quality and/or*  
526 *environmental management systems auditing* and have been adapted to reflect the  
527 context of this International Standard.  
528  
529

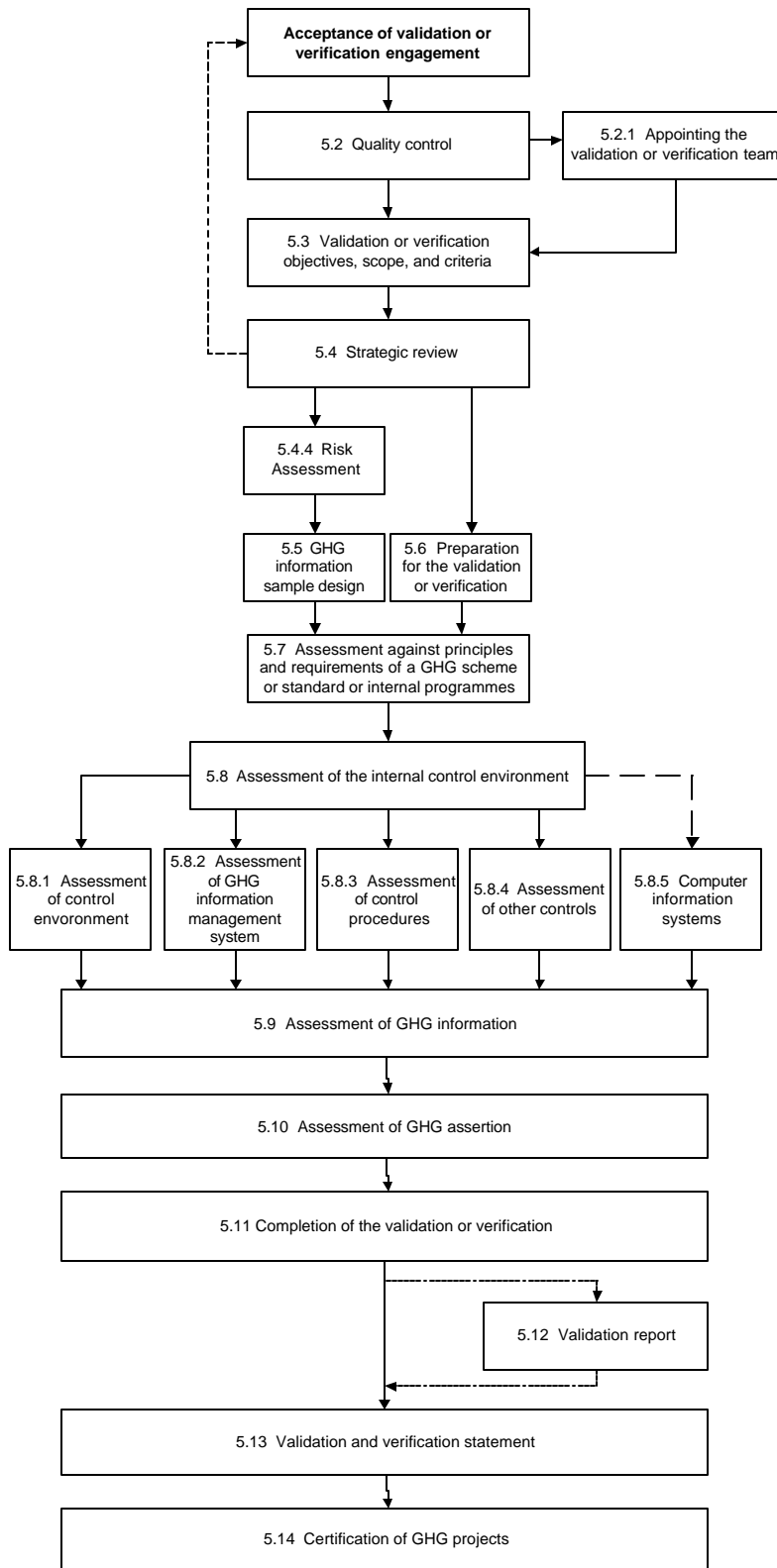
## 530 **5.0 Validation and verification requirements**

### 531 **5.1 General**

532 This clause contains requirements for planning, managing and conducting GHG  
533 validation and verification activities for GHG projects (validation and/or verification) or  
534 organizations (verification).  
535

536 The process of conducting validation and verification is similar, but the inherent nature of  
537 the information is different. Validations usually rely on estimates and projections and  
538 verification usually relies on historical information. Consequently, when reading Clause  
539 5.0, these differences must be taken into consideration.  
540

541 Figure 1 shows the process for completing a validation or verification based on Clause 5  
542 requirements. Additional guidance on Clause 5 requirements may be found in Annex A.  
543



544  
 545  
 546

**Figure 1 – Validation and verification process**

547 **5.2 Quality control**

548 The validation or verification body shall implement quality control policies and  
549 procedures designed to ensure that its validation or verification work is completed in  
550 accordance with:

- 551 a) The agreed objectives, scope and criteria of the validation or verification;
- 552 b) Relevant GHG scheme principles and requirements or standards, as appropriate.

553

554 The validation or verification body shall communicate quality control policies and  
555 procedures to those undertaking the validation or verification such that they are  
556 understood and implemented.

557 **5.2.1 Appointing the validation or verification team**

558 The validation or verification body shall appoint a competent team leader to manage the  
559 validation or verification process and the validation or verification team. The team leader  
560 and team members shall have skills and competence consistent with their roles and  
561 responsibilities.

562

563 The validation or verification body shall ensure the overall competence of the validation  
564 or verification team by:

- 565 a) Confirming that the validation or verification body is accredited to operate under  
566 any GHG scheme included within the objectives, scope and criteria of the  
567 validation or verification, where this is a requirement of the GHG scheme;
- 568 b) Identifying the knowledge, skills and competence needed to achieve the  
569 objectives of the validation or verification;
- 570 c) Selecting a team leader and team members with all necessary knowledge, skills  
571 and competences represented.

572

573 If not fully represented by the validation or verification team, the necessary knowledge,  
574 skills and competencies shall be provided by objective experts. Experts shall operate  
575 under the direction of the team leader.

576

577 The selection of the validation or verification team shall avoid any actual or potential  
578 conflicts of interest with the client, the responsible party and the intended users of the  
579 GHG information.

580

581 NOTE – Guidance on appropriate knowledge, skills and competencies for validators and  
582 verifiers may be found in Annex B.

583

584 **5.3 Validation or verification objectives, scope, and criteria**

585 The validator or verifier and the client shall agree on the validation or verification  
586 objectives, scope, criteria and level of assurance required at the beginning of the  
587 validation or verification process (Figure 2).

588

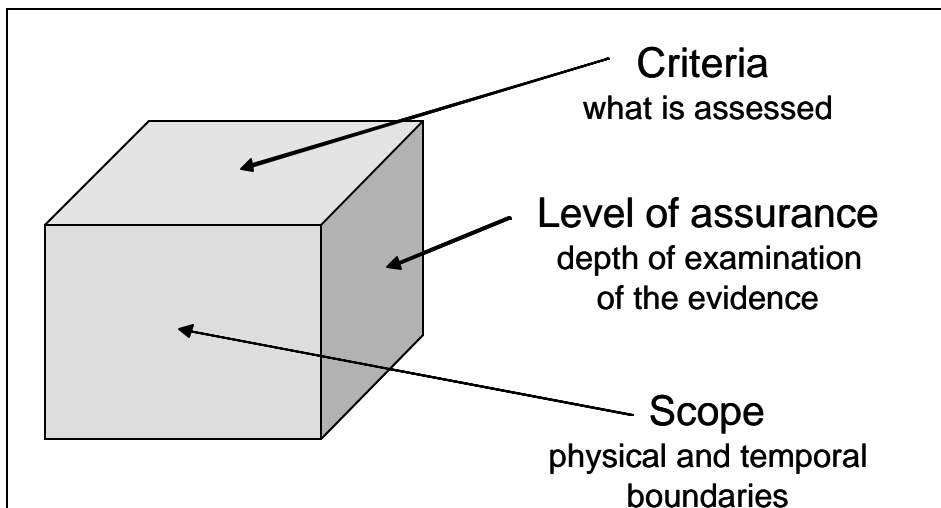
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**Figure 2 - Extent of Validation or Verification Activities**

**5.3.1 Objectives - GHG project validation**

The objective of GHG project validation is to enable the validator to express an opinion on the completeness, consistency, conservativeness and accuracy of the responsible party's GHG assertion(s). The validator, in expressing an opinion, shall assess the probability that implementation of the planned GHG project will result in the GHG emission reductions and/or removal enhancements as stated or claimed by the responsible party. The validator, in expressing an opinion, shall take account of:

- a) Conformance with applicable validation criteria, including the principles and requirements of applicable GHG schemes or standards within the scope of validation;
- b) The justification and documentation of the GHG project plan, including the following components:
  - i. Description of the project;
  - ii. Determination of the baseline;
  - iii. Project and baseline quantification procedures;
  - iv. Estimation of GHG emission reductions and removal enhancements;
  - v. Quality, monitoring and reporting plans or procedures.
- c) Design of GHG-related internal controls.

**5.3.2 Objectives - GHG project verification**

The objective of GHG project verification is to enable the verifier to express an opinion on the completeness, consistency, conservativeness and accuracy of the responsible party's GHG assertion(s). The verifier, in expressing an opinion, shall take account of:

- a) Conformance with applicable validation or verification criteria, including the principles and requirements of applicable GHG schemes or standards within the scope of validation;
- b) The implementation of the GHG project plan and GHG project performance, including the following components:
  - i. Description of the project;

- 638 ii. Project and reporting period details, including start dates, durations and end  
639 dates,  
640 iii. Project GHG emissions and removals;  
641 iv. Determination of the baseline;  
642 v. Baseline GHG emissions and removals;  
643 vi. GHG emissions reduction or removal enhancements;  
644 vii. Uncertainty assessment;  
645 viii. Quality and monitoring plans or procedures.  
646 ix. the reporting of project performance, including reference to the stated aims  
647 and estimations contained with the project plan;  
648 c) Any significant changes to the GHG project plan since the last reporting period or  
649 since project validation;  
650 d) Any significant changes in project and baseline emissions, removals, emission  
651 reductions and removal enhancements since the last reporting period or since  
652 project validation;  
653 e) The effectiveness of actual GHG-related internal controls.

### 654 **5.3.3 Objectives - organizational GHG verification**

655 The objective of organization GHG verification is to enable the verifier to express an  
656 opinion on the completeness, consistency, accuracy and transparency of the responsible  
657 party's GHG assertion(s). The verifier, in expressing an opinion, shall take account of:

- 658 a) Conformance with applicable verification criteria, including the principles and  
659 requirements of relevant GHG schemes or standards, within the scope of  
660 verification;  
661 b) The organization's GHG inventory, including its GHG emissions and removals;  
662 c) Any significant changes in the organization's GHG inventory since the last  
663 reporting period;  
664 d) The effectiveness of actual GHG-related internal controls.

### 665 **5.3.4 Scope - validation and verification**

666 The scope of the validation or verification shall be agreed with the client. The validation  
667 or verification scope shall describe the extent and boundaries of the validation or  
668 verification process, including:

- 669 a) Organization or GHG project boundaries, including legal, financial, operational  
670 and geographic boundaries;  
671 b) Organization or GHG project physical infrastructure, activities, technologies and  
672 processes;  
673 c) GHG sources or sinks to be included;  
674 d) Types of GHGs to be included;  
675 e) The time period(s) to be covered;  
676 f) The frequency of any subsequent verification processes required during the GHG  
677 project or organization's GHG programme;  
678 g) The timing, intended audience and intended use(s) for the validation report and  
679 the validation or verification statement.

### 680 **5.3.5 Criteria - validation and verification**

681 The criteria of the validation or verification shall be agreed with the client. The  
682 validation or verification criteria shall conform to the principles and requirements of

683 relevant GHG schemes or standards within the scope of validation or verification.

684 Validation or verification criteria may include:

- 685 a) GHG performance targets;
- 686 b) Eligibility requirements.

687

#### 688 **5.4 Strategic review**

689 The validator or verifier shall conduct a strategic review of the organization's or GHG  
690 project's GHG information to assess the likely:

- 691 a) Nature, scale and complexity of the validation or verification activity to be  
692 undertaken on the client's behalf;
- 693 b) Level of risk associated with uncertainty, material misstatement, omission or  
694 error in the responsible party's GHG information and assertion(s).

695

696 The strategic review should be carried out, where possible, prior to commencing the  
697 validation or verification to enable an effective validation or verification plan to be  
698 designed.

699

700 The strategic review process shall include an initial evaluation of the organization's or  
701 GHG project's GHG information and assertion(s), including a determination that the  
702 GHG information provided by the responsible party is a complete representation of GHG  
703 emissions, removals, emission reductions or removal enhancements.

704

705 The validation or verification team leader shall inform the responsible party if the initial  
706 evidence presented by the responsible party is found to be inadequate and request  
707 further information until the validator or verifier is able to proceed with the validation or  
708 verification. The validator or verifier shall suspend or postpone the validation or  
709 verification process if requests for further information have not generated sufficient  
710 additional evidence to permit the validation or verification to proceed.

#### 711 **5.4.1 Strategic review – validation of GHG projects**

712 The strategic review for the validation of GHG projects shall include a review of the  
713 following information and documentation:

- 714 a) The responsible party's GHG assertion(s);
- 715 b) Principles and requirements of GHG schemes or standards to be met by the  
716 GHG project, including any pre-determined quantitative requirements such as  
717 materiality thresholds or performance targets;
- 718 c) The GHG project plan, including the components listed in Clause 5.3.1(b).
- 719 d) Operational and control procedures to be implemented by the responsible party  
720 to ensure the quality, integrity and security of its GHG information;
- 721 e) Language, cultural or social issues that may affect the execution of an effective  
722 validation.

#### 723 **5.4.2 Strategic review – verification of GHG projects**

724 The strategic review for the verification of GHG projects shall include a review of the  
725 following information and documentation:

- 726 a) The responsible party's GHG assertion(s) and related previous assertion(s);

- 727 b) Principles and requirements of GHG schemes or standards to be met by the  
728 GHG project, including any pre-determined quantitative requirements such as  
729 materiality thresholds or performance targets;  
730 c) The GHG project plan, including the components set out in Clause 5.3.1(b).  
731 d) Significant changes to the GHG project plan since the last verification period or  
732 since the validation, including any changes to legal, financial, operational or  
733 geographic boundaries;  
734 e) The GHG project validation report and statement, including the level of  
735 assurance provided;  
736 f) Previous validation reports and statements, verification statements or  
737 certifications;  
738 g) The GHG project report or information, including:  
739 i. Project and reporting period start dates, durations and end dates;  
740 ii. Project GHG emissions and removals quantification procedures;  
741 iii. Project GHG emissions and removals, including appropriate raw data;  
742 iv. Baseline GHG emissions and removals quantification procedures;  
743 v. Baseline GHG emissions and removals, including appropriate raw data;  
744 vi. GHG emission reductions and removal enhancements quantification  
745 procedures;  
746 vii. GHG emission reductions and removal enhancements, including appropriate  
747 raw data;  
748 viii. Project and baseline GHG sources or sinks not subject to regular monitoring  
749 or quantification procedures;  
750 ix. Uncertainty assessment;  
751 x. Quality and monitoring plans or procedures.  
752 g) The operational and control procedures implemented by the responsible party to  
753 ensure the quality, integrity and security of its GHG information;  
754 h) GHG information management system processes used to gather, collate,  
755 transfer, process, analyze, correct or adjust, aggregate (or disaggregate) and  
756 store the responsible party's GHG information;  
757 i) Processes used to gather and review any documentation that supports the GHG  
758 information provided;  
759 j) Evidence of any changes introduced as a result of recommendations from  
760 previous validations or verifications;  
761 k) Language, cultural or social issues that may affect the execution of an effective  
762 verification.  
763 l) Reports containing statements on project GHG emissions, removals, emission  
764 reductions or removal enhancements related to the responsible party's GHG  
765 assertion(s).

766 **5.4.3 Strategic review – verification of organizational GHG information**

767 The strategic review for the verification of organizational GHG information shall include a  
768 review of the following information and documentation:

- 769 a) The organization's GHG assertion(s) and related previous assertion(s);  
770 b) Principles and requirements of GHG schemes or standards to be met by the  
771 organization, including any pre-determined quantitative requirements such as  
772 materiality thresholds or performance targets;  
773 c) Previous verification reports, statements or certificates;

- 774 d) Significant changes to organizational or GHG emissions or removal boundaries  
775 since the last verification period, including any changes to legal, financial,  
776 operational or geographic boundaries;
- 777 e) The GHG inventory or information, including:
- 778 i. Description of the organization;
- 779 ii. Period covered inventory or information;
- 780 iii. Description and justification of organizational boundaries;
- 781 iv. Gross direct GHG emissions separately quantified for each facility, GHG  
782 source and type;
- 783 v. Gross GHG removals separately quantified for each facility and GHG sink (if  
784 applicable);
- 785 vi. Description and justification for the estimation or exclusion of any GHG  
786 source or sink;
- 787 vii. Gross indirect GHG emissions associated with the import or purchase of  
788 electricity, heat, steam or other fossil fuel-derived energy products separately  
789 for each type of GHG (if applicable);
- 790 viii. Gross indirect GHG emissions associated with other non-energy activities  
791 separately quantified for each type of GHG (if applicable);
- 792 ix. GHG emission reductions or removal enhancements from GHG projects  
793 quantified within organizational boundaries (if applicable);
- 794 x. GHG emission reductions or removal enhancements from GHG projects  
795 quantified outside organizational boundaries (if applicable);
- 796 xi. Description and justification of the base year selected or any change to the  
797 base year selected (if established);
- 798 xii. The base year GHG inventory (if established);
- 799 xiii. Description and justification for any adjustment to the base year GHG  
800 inventory, including application of the base year GHG inventory adjustment  
801 policy (if established);
- 802 xiv. Description and justification of GHG emissions and removals quantification  
803 methodologies;
- 804 xv. Description and justification of any change to GHG emissions and removals  
805 quantification methodologies previously used;
- 806 xvi. Description and justification for the selection of GHG emissions factors.
- 807 f) The operational and control procedures implemented by the organization to  
808 ensure the quality, integrity and security of its GHG information;
- 809 g) GHG information management system processes used to gather, collate,  
810 transfer, process, analyze, correct or adjust, aggregate (or disaggregate) and  
811 store the organization's GHG information;
- 812 h) Processes used to gather and review any documentation that supports the GHG  
813 information provided;
- 814 i) Evidence of any changes introduced as a result of recommendations from  
815 previous verifications;
- 816 j) Language, cultural or social issues that may affect the execution of an effective  
817 verification;
- 818 k) Reports containing statements on GHG emissions, removals, emission  
819 reductions or removal enhancements related to the organization's GHG  
820 assertion(s).
- 821

822 **5.4.4 Risk Assessment**

823 The validator or verifier shall conduct a risk assessment. The categories of risk  
824 considered shall be:

- 825 a) Inherent risk: The inherent risk of a material misstatement occurring;
- 826 b) Control risk: The risk that the organization's or GHG project's internal controls  
827 will not prevent or detect a material misstatement;
- 828 c) Detection risk: The risk that any material misstatement that has not been  
829 corrected by the organization's or GHG project's internal control will not be  
830 detected by the validator or verifier.

831  
832 The validator or verifier shall use the information compiled in the strategic review to  
833 assess inherent and control risk. Inverse relationships among inherent, control and  
834 detection risks shall be used to determine the nature, extent and timing of the sample  
835 design and substantive procedures.  
836

837 **5.5 GHG information sample design**

838 The validator or verifier shall develop a sample design. The sample design shall be  
839 based on the results of the risk assessment completed as part of the strategic review, in  
840 particular where a material misstatement is likely to cause a material impact and the  
841 organization or GHG project's control environment and internal control procedures are  
842 unlikely to detect and correct the misstatement.

843  
844 The sample design shall take account of:

- 845 a) Validation or verification scope;
- 846 b) Level of assurance agreed to with the client;
- 847 c) Validation or verification criteria;
- 848 d) Results of the strategic review, including the risk assessment.

849  
850 The sample design shall be amended based on any new risks or material concerns  
851 identified throughout the validation or verification process.  
852

853 **5.6 Preparation for the validation or verification**

854 The validation or verification team leader shall plan the validation or verification work  
855 such that it can be conducted in an effective and timely manner.  
856

857 The validation or verification team leader should develop and document the validation or  
858 verification plan describing:

- 859 a) The expected objectives, scope and criteria of the validation or verification,  
860 including the risk, materiality thresholds and level of assurance that the client  
861 requires;
- 862 b) All validation or verification activities to be undertaken, including a description of  
863 the type, timing and extent of planned GHG testing methodologies;
- 864 c) The GHG information sampling design.

865  
866 The overall validation or verification plan should be revised as necessary during the  
867 course of the validation or verification process.  
868

- 869 The extent of validation or verification planning may vary according to the:
- 870 a) Size or complexity of the organization or GHG project;
  - 871 b) Validation or verification team's experience and knowledge of the organization or
  - 872 GHG project,
  - 873 c) Complexity of the validation or verification;
  - 874 d) Industrial sector;
  - 875 e) Technology or processes used.
- 876

877 The validation or verification team leader shall ensure effective communication with the

878 client's management and/or, where appropriate, those responsible for the GHG

879 inventory or GHG project in order to:

- 880 a) Confirm the validation or verification plan, including the objectives, scope and
  - 881 criteria of the validation or verification;
  - 882 b) Describe to the client how validation or verification activities will be undertaken;
  - 883 c) Confirm communication channels;
  - 884 d) Provide an opportunity for the client to ask questions.
- 885

886 NOTE – In verification situations, an opening meeting is often used for this

887 communication.

888

## 889 **5.7 Assessment against principles and requirements of a GHG scheme or**

### 890 **standard or internal programmes**

891 Where the objectives, scope and criteria of the validation or verification include reference

892 to a GHG scheme or standard, the validator or verifier shall, as appropriate, confirm and

893 determine that the organization or GHG project:

- 894 a) Is eligible to participate in the GHG scheme or standard;
  - 895 b) Will or has used GHG estimation, quantification, monitoring and reporting
  - 896 approaches and methodologies that are approved by, or meet the requirements
  - 897 of, the GHG scheme or standard;
  - 898 c) Will or has met the GHG performance requirements or targets specified by, or
  - 899 agreed with, the GHG scheme administrators or required by the standard;
  - 900 d) Will or has reported GHG information that is complete, consistent, accurate and
  - 901 transparent;
  - 902 e) Has an adequate understanding of the principles and requirements of the GHG
  - 903 scheme or standard and are competent to conform to them;
  - 904 f) Has specified a level of assurance through the client that is consistent with the
  - 905 principles and requirements of the GHG scheme or standard;
  - 906 g) Has justified and documented any significant changes to organizational or GHG
  - 907 project boundaries that may lead to a significant or material change in the
  - 908 organization's or project's GHG emissions, removals, emission reductions or
  - 909 removal enhancements since the previous validation or verification period and
  - 910 may affect the organization's or GHG project's ability to conform with the
  - 911 principles, requirements or GHG performance targets of the GHG scheme.
- 912

913 Where the organization or GHG project is seeking entry into a GHG scheme that

914 includes specific entry requirements, the validator or verifier [shall] [should] seek proof

915 that the organization or GHG project has been registered or meets the registration

916 criteria for the GHG scheme. In such cases, the validation or verification body should

917 ensure that it is familiar with its roles and responsibilities in securing registration for the  
918 organization or GHG project under the GHG scheme.

919  
920 Where the objectives, scope and criteria of the verification includes reference to the  
921 organization's internal GHG programmes or performance targets, the validator or verifier  
922 shall, as appropriate, confirm and determine the:

- 923 a) GHG programme follows the organization's documented policies, procedures  
924 and codes of conduct;
- 925 b) Organization's performance against any target(s);
- 926 c) Organization's management and staff have an adequate understanding of the  
927 objectives and targets of the GHG programme;
- 928 d) Level of assurance specified by the client is consistent with the aims of the  
929 organization's GHG programme;
- 930 e) Organization has justified and documented any significant changes to  
931 organizational or GHG emissions or removal boundaries that may affect the  
932 organization's ability to conform with its internal GHG programmes.

933

934 **5.8 Assessment of the internal control environment**

935 An assessment of the organization's or GHG project's internal control environment shall  
936 be undertaken to ensure that:

- 937 a) The risk of non-conformance or deviations from principles or requirements of the  
938 GHG scheme or standard and/or stated performance targets is minimized;
- 939 b) To determine the strategy for detailed testing of GHG information.

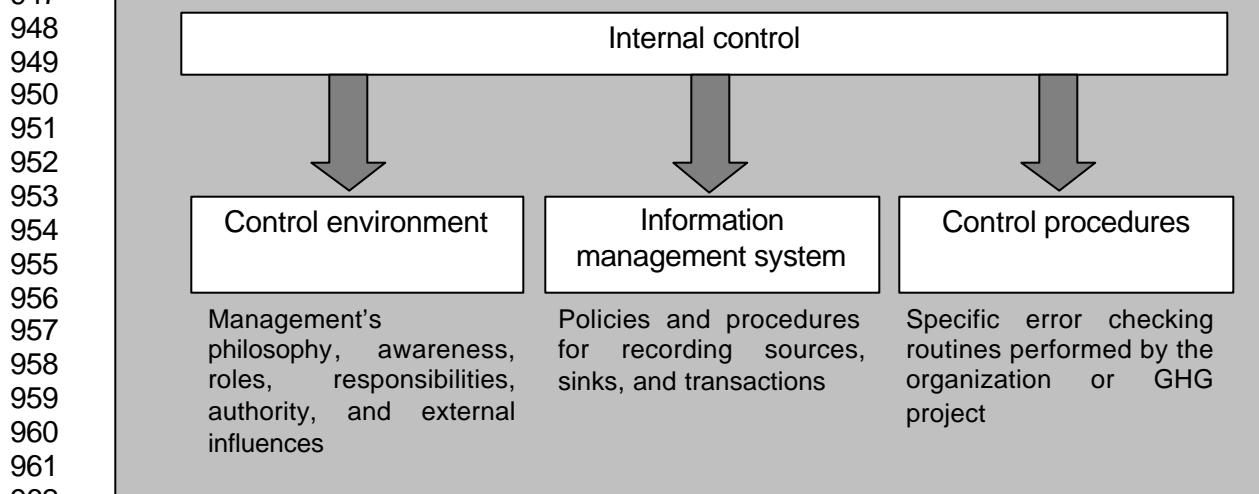
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941 The internal control environment consists of three elements that require simultaneous  
942 assessment (Figure 3):

- 943 a) Control environment,
- 944 b) GHG information management and associated systems;
- 945 c) Control procedures.

946

947



962

963

964

**Figure 3 - Elements of an internal control environment**

965 In the case of GHG project validation, assessing the effectiveness of internal control  
966 environments may be practically limited to what is planned, as the validation activity is  
967 usually performed before the GHG project has been implemented. When validating GHG  
968 projects, the validator shall assess the effectiveness of documented internal control  
969 environments as stated in the GHG project plan or through how GHG scheme  
970 registration requirements were met.

#### 971 **5.8.1 Assessment of control environment**

972 The control environment influences, but does not ensure, the operational effectiveness  
973 and efficiency of the GHG information management system and the application of  
974 control procedures.

975  
976 The validator or verifier shall use information on the organization's or GHG project's  
977 control environment to help them plan the GHG validation or verification. The validation  
978 or verification team shall assess the effectiveness of the organization's or GHG project's  
979 control environment in minimising the risk of errors or omissions within the GHG  
980 information system considering:

- 981 a) Management's directions, philosophy, awareness and operations in relation to  
982 GHG information and reporting;
- 983 b) The organization's or GHG project's approach to assigning roles and  
984 responsibilities within its GHG programmes and/or GHG projects, including  
985 confirmation of individual and collective competency and availability of time and  
986 resources necessary for effective and timely monitoring and reporting;
- 987 c) External influences that may affect management's behaviour in relation to GHG  
988 information and reporting.

#### 989 **5.8.2 Assessment of GHG information management system**

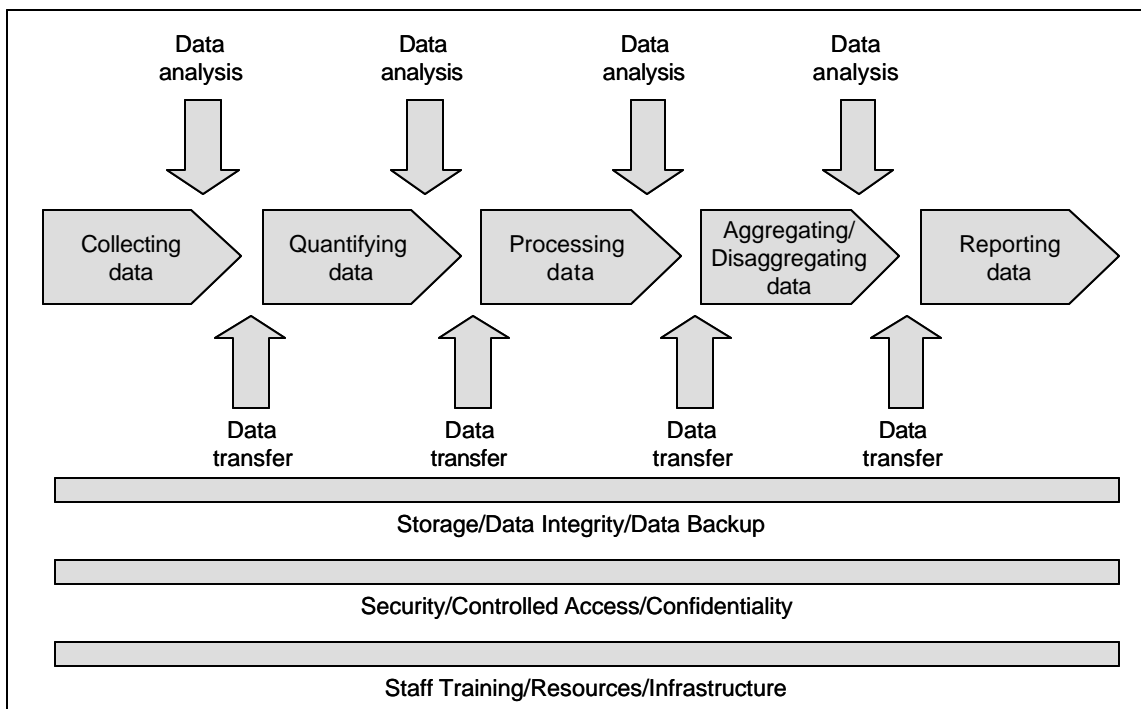
990 The validation or verification team shall assess the effectiveness of the organization's or  
991 GHG project's GHG information management system in minimising the risk of errors or  
992 omissions within the GHG information system considering:

- 993 a) Methods of data or information collection and the relative reliance placed on  
994 GHG data or information from different sources;
- 995 b) Processes for selecting and implementing GHG estimation and quantification  
996 methodologies;
- 997 c) Processes for processing, aggregating or disaggregating GHG data;
- 998 d) Processes for reporting and disseminating GHG information;
- 999 e) The completeness, consistency, accuracy and transparency of the GHG  
1000 information management system.

1001

1002 Figure 4 shows the components of a GHG information system, including data handling  
1003 and the operations that may be used to convert GHG data to GHG information.

1004



1005

1006

1007

**Figure 4 - Components of a GHG information management system**

1008

**5.8.3 Assessment of control procedures**

1009

The validation or verification team shall assess the effectiveness of the organization's or GHG project's control procedures in minimising the risk of errors or omissions within the GHG information system considering:

1012

a) The robustness of the GHG information management system;

1013

b) The completeness, consistency, accuracy and transparency of data collection and input into the GHG information management system;

1014

c) The selection and application of selected GHG quantification methodologies;

1015

d) The appropriateness of aggregation or disaggregation methodologies;

1016

e) Provisions related to staff training and competency, resources and infrastructure;

1017

f) Reconciliation processes for different facilities or GHG projects using different data management approaches to collate, transfer, process, analyze, aggregate, disaggregate, adjust and store their GHG information (where applicable).

1018

1019

1020

1021

**5.8.4 Assessment of other controls**

1022

Elements of the internal control environment may exist in conjunction, or integrated, with other related controls. Other related controls, including controls within any existing financial, business or environmental management systems, may influence the management and operation of the organization's or GHG project's physical stock, machinery, technologies, infrastructure and processes.

1023

1024

1025

1026

1027

1028 The validation or verification team shall assess the effectiveness of the organization's or  
1029 GHG project's other controls in minimising the risk of errors or omissions within the GHG  
1030 information system considering:

- 1031 a) Documentation of organizational or GHG project operational or GHG emissions  
1032 or removal boundaries, including any changes to legal, financial, operational or  
1033 geographic boundaries;
- 1034 b) The completeness of the organization's or GHG project's internal controls and  
1035 operational procedures in relation to the scope of the validation or verification  
1036 and reported GHG information and assertion(s), including the relationship  
1037 between any existing financial, business or environmental management systems  
1038 and internal controls;
- 1039 c) The organization's or GHG project's internal controls and operational procedures,  
1040 processes and technologies and the implementation and/or usage of these over  
1041 the verification period, including the effectiveness of internal calibration,  
1042 monitoring and verification plans or procedures and their appropriateness to the  
1043 nature, scale and complexity of GHG-related operations or GHG projects;
- 1044 d) Records of the organization's or GHG project's performance relating to its control  
1045 procedures, processes and technologies, including any reported non-  
1046 conformances, incidents, accidents or reported emergencies during the period of  
1047 the validation or verification;
- 1048 e) Relevant non-conformances, incidents, accidents or reported emergencies  
1049 during the previous validation or verification period, including whether they have  
1050 re-occurred;
- 1051 f) Any changes in control procedures, processes and technologies since the  
1052 validation or previous verification, including their likely impact on the level of risk  
1053 and materiality issues relating to the GHG information, GHG information  
1054 management system or associated control environments;
- 1055 g) Any changes in the organization's or GHG project's product/service mix or  
1056 ranges that may have a material effect on the responsible party's GHG  
1057 information and assertion(s).

## 1058 **5.8.5 Computer information systems**

1059 Where the GHG information management system exists in part, or as a whole, as a  
1060 computer information system, the following shall be considered in addition to the  
1061 requirements in Section 5.8.2.

### 1062 **5.8.5.1 Systems risks**

1063 The validation or verification team shall consider:

- 1064 a) Significant risks to the completeness, consistency, accuracy and transparency of  
1065 reported GHG information from actual or potential failures in the computer  
1066 information system environment;
- 1067 b) Breaches of information security that may lead to failures or increased risk in the  
1068 collation, transfer, processing, analysis, aggregation, disaggregation, adjustment  
1069 and storage in reported GHG information;
- 1070 c) Relationships between different computer information systems, including  
1071 potential affects on GHG information quality and integrity.

1072 **5.8.5.2 Application risks**

1073 The validation or verification team shall consider:

- 1074 a) Potential spreadsheet function, software coding, computer scripting or other
- 1075 errors that may lead to significant errors, omissions or material misstatements in
- 1076 the reported GHG information;
- 1077 b) Potential human errors in the computer information system environment.
- 1078

1079 **5.9 Assessment of GHG information**

1080 Using the sample design and substantive procedures to optimise the validation and

1081 verification process and to test the GHG information, the validation and verification team

1082 shall assess the organization's or project's GHG information considering:

- 1083 a) The completeness, consistency, accuracy and transparency of the GHG
- 1084 information, including raw data origins,
- 1085 b) The appropriateness of selected GHG estimation and quantification
- 1086 methodologies;
- 1087 c) The appropriateness of selected GHG baseline quantification methodologies (if
- 1088 applicable);
- 1089 d) Whether different facilities or GHG projects (where more than one project is
- 1090 being assessed within the same validation or verification scope) are using
- 1091 different data management approaches to collate, transfer, process, analyse,
- 1092 aggregate, disaggregate, adjust and store their GHG information and how these
- 1093 differences are handled in the GHG information reporting process;
- 1094 e) The crosschecking of GHG information through other quantification
- 1095 methodologies;
- 1096 f) Uncertainties in the GHG information arising from different data sources or GHG
- 1097 quantification methodologies;
- 1098 g) The accuracy and uncertainty of GHG information where a GHG scheme
- 1099 specifies a materiality threshold to which the GHG assertion must adhere;
- 1100 h) If applicable, the maintenance and calibration programme for equipment used to
- 1101 monitor and measure GHG emissions or removals, including confirming the
- 1102 accuracy of equipment to meet the required accuracy of reporting and any
- 1103 changes to programme that may have a material effect on the reported GHG
- 1104 information and assertions;
- 1105 i) Any other factors that are likely to significantly affect the GHG information.
- 1106

1107 **5.10 Assessment of the GHG assertion**

1108 The validation or verification team shall determine whether the reported GHG

1109 information reflects the GHG assertion(s) being made based on the assessment of GHG

1110 information and control environments. The validation or verification team shall assess

1111 the GHG assertion(s) by comparing the organization's or GHG project's GHG-related

1112 performance against a range of performance criteria, including:

- 1113 a) The agreed validation or verification objectives, scope and criteria;
- 1114 b) The performance of the responsible party against any principles or requirements
- 1115 of the GHG scheme or standard and/or any GHG performance targets it has
- 1116 subscribed to;
- 1117 c) The level of proof provided by objective evidence gathered during the validation
- 1118 or verification that the organization's or GHG project's GHG assertion(s) reflect

1119 actual performance and is supported by complete, consistent, accurate and  
1120 transparent GHG information.  
1121

### 1122 **5.11 Completion of the validation or verification**

1123 The validation or verification is complete when all activities described in the validation or  
1124 verification plan have been carried out and the validation or verification working papers  
1125 and supporting evidence have been submitted to the validation or verification body for  
1126 consideration and independent decision-making. The completion of the validation or  
1127 verification shall:

- 1128 a) Include a closing meeting with the responsible party and/or the client (as  
1129 appropriate), at which the findings and conclusions of the validation or verification  
1130 are communicated, including any required corrective actions and a timeframe for  
1131 their completion;
- 1132 b) As necessary, obtain final data from the responsible party and/or client relevant  
1133 to the scope of the validation or verification, including data that have been  
1134 adjusted for reasons of materiality as a result of the validation or verification  
1135 process;
- 1136 c) As necessary, assess the organization's or GHG project's rationale and  
1137 explanation for differences between the final GHG information submitted to the  
1138 validation or verification team and any GHG information previously submitted to  
1139 the validation or verification body;
- 1140 d) Identify any inconsistencies that the organization or GHG project needs to  
1141 resolve;
- 1142 e) Close out any outstanding validation or verification trails or inconsistencies;
- 1143 f) Ensure that validation or verification working papers and supporting evidence (for  
1144 example notes, diagrams, calculations, spreadsheets) are complete and ready  
1145 for review by the validation or verification body;
- 1146 g) Ensure that decisions made during the validation or verification are clearly  
1147 documented;
- 1148 h) Ensure that objective evidence and validation and verification trails are clearly  
1149 documented and sufficiently support validation or verification objectives and the  
1150 decisions made by the validation or verification team.

1151  
1152 As appropriate, where the final sign-off of GHG information and/or GHG assertion(s) is  
1153 subsequent to the closing meeting, for example when the responsible party has  
1154 undertaken required corrective action, the validation or verification team shall conduct a  
1155 subsequent review to finalize any validation or verification conclusions and issue the  
1156 validation or verification statement.

1157  
1158 In GHG project validations, all issues may not be resolved until the GHG project has  
1159 been commissioned or has reached day-to-day operational status. This situation may be  
1160 reflected in the validation statement in the form of limitations or qualifications that may  
1161 become invalid once the GHG project has achieved operational status.

### 1162 **5.12 Validation report**

1164 The validator shall produce, and is responsible for, a validation report following the  
1165 completion of the validation. The validation report shall be addressed to the responsible  
1166 party and/or the client as agreed with the client.

1167 The content and delivery of the validation report shall be agreed by the responsible party  
1168 and validator and should be based on the agreed scope, objectives and criteria of the  
1169 validation. The validation report shall provide a complete, accurate and clear record of  
1170 the validation activities undertaken, and shall, as a minimum, include:

- 1171 a) Validation objectives, scope and criteria;
- 1172 b) GHG project plan details, including:
  - 1173 i) Description of the project;
  - 1174 ii) Determination of the baseline;
  - 1175 iii) Project and baseline quantification procedures;
  - 1176 iv) Estimation of GHG emission reductions and removal enhancements;
  - 1177 v) Quality, monitoring and reporting plans or procedures.
- 1178 c) An assessment of the likelihood that the GHG project will achieve estimated  
1179 GHG emissions reductions or removal enhancements;
- 1180 d) Identification of the client and responsible party, if different;
- 1181 e) Identification of the validation team, including the team leader(s) and external  
1182 experts;
- 1183 f) Affirmation of the independence of the validators;
- 1184 g) Validation activities conducted, including their date and place;
- 1185 h) Findings, including any corrective actions that need to be undertaken by the  
1186 responsible party;
- 1187 i) Level of assurance (if provided);
- 1188 j) Conclusions.

1189  
1190 The validation report should be dated and approved in accordance with validation body's  
1191 quality assurance and quality control procedures.

1192  
1193 NOTE 1 - Where it is necessary for the GHG project to complete corrective actions, the  
1194 validation body may issue a draft validation report. The final validation report would be  
1195 issued when the responsible party had addressed all corrective actions to the  
1196 satisfaction of the validation body.

1197  
1198 NOTE 2: The validation report may be used as a continuous improvement mechanism  
1199 for future verification activities.

### 1200 1201 **5.13 Validation and verification statement**

1202 The validation or verification body shall issue a validation or verification statement to the  
1203 responsible party. The validation or verification statement shall:

- 1204 a) Be accompanied by the responsible party's GHG assertion;
- 1205 b) Be addressed to the intended users of the GHG information;
- 1206 c) Clearly describe the level of assurance provided by the validation or verification  
1207 consistent with the agreed objectives, scope and criteria of the validation or  
1208 verification.

1209  
1210 The validation or verification statement shall clearly express any circumstance where the  
1211 validation or verification body:

- 1212 a) Is of the view that one, some, or all aspects of the GHG information does not  
1213 conform to the agreed verification or validation criteria;

- 1214 b) Is of the view that the responsible party's GHG assertion is inappropriate in  
1215 relation to the agreed validation or verification criteria;  
1216 c) Is unable to obtain sufficient, appropriate, objective evidence to assess one or  
1217 more aspects of conformity of the GHG information with the agreed validation or  
1218 verification criteria and the responsible party's GHG assertion;  
1219 d) Has found it necessary to limit or qualify its opinion.  
1220

1221 **5.14 Certification of GHG performance**

1222 In some GHG schemes, GHG certification occurs once an independent GHG verifier  
1223 issues a written assurance that, during a specified time period, an organization or GHG  
1224 project achieved GHG-performance (for example GHG emissions, removals, emission  
1225 reductions, removal enhancements) as asserted by the responsible party. The outcome  
1226 of the certification process is often a formal, written declaration issued by the GHG  
1227 scheme administrator to the responsible party.  
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**Annex A**  
**(informative)**  
**Guidance on validation and verification requirements**

Annex A provides guidance on the validation and verification requirements contained in Clause 5 of this International Standard. Annex A is informative and does not include mandatory requirements. Guidance notes are numbered consistent with respective Clauses of Sections 5.

**A.5 Guidance on validation and verification requirements**

**Roles and responsibilities**

In order to ensure an effective validation or verification, it is important to understand the roles and responsibilities of the parties to the process (Figure A1).

Validation and verification occurs when an impartial validator or verifier objectively evaluates a GHG assertion(s) that has been made by another responsible party – typically the management of an organization or GHG project - against identified and suitable criteria. The validator or verifier then expresses a conclusion that provides the intended user of the information (for example an organization or GHG project), the client (if the two are different) or any other stakeholder likely to be affected by the GHG assertion, with a level of assurance that the GHG assertion(s) is factually correct and contains no errors, omissions or material misstatements. Therefore:

- a) The client commissions the validator or verifier to undertake the validation or verification and should ensure that the validator or verifier has sufficient information to determine whether they are capable and competent to conduct the work. It is also the responsibility of the client to agree to the validation or verification objectives, scope and criteria with the validator or verifier;
- b) The organization or GHG project (the responsible party) should be responsible for making the GHG assertion(s) and providing it to the objective validator or verifier, along with any information required to support the GHG assertion(s);
- c) The validator or verifier should then produce findings and conclusions in the form of a validation report or validation or verification statement, which is distributed to those parties specified in the contract with the client;
- d) The intended user of the information may be the client, the responsible party, GHG scheme administrators, regulators, the financial community or other affected stakeholders, such as local communities, government departments or non-governmental organisations. There is an underlying assumption that the intended user is a reasonably intelligent and informed reader of the validation report or validation or verification statement.

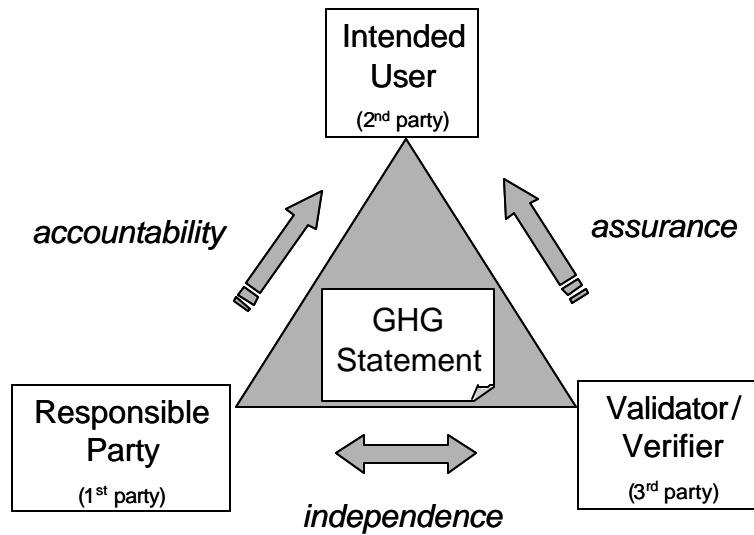


Figure A1 – Roles and responsibilities

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**Activities and decision points**

Figure A2 shows key relationships between activities and decision points in the validation and verification process leading to the issuance of a validation or verification statement.

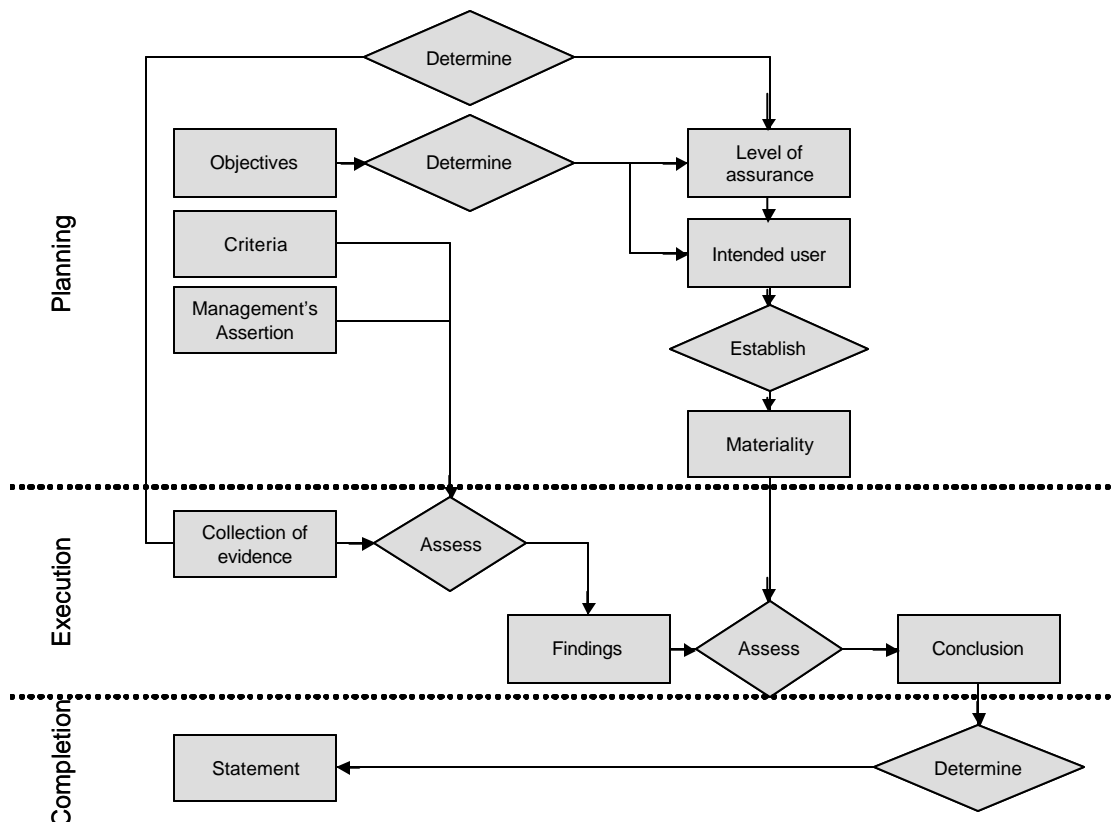


Figure A2 – Validation and verification activities and decision points

1302 **Collection of evidence**

1303 Validation and verification activities typically focus on gathering three types of evidence -  
1304 physical, documentary, and testimonial - by following steps outlined in the validation or  
1305 verification plan:

- 1306 a) Physical evidence refers to something that can be seen or touched, such as fuel  
1307 or utility meters, emission monitors or calibration equipment. Physical evidence is  
1308 gathered by direct observation of equipment or processes, and is persuasive  
1309 because it demonstrates that the organization being verified is in the practice of  
1310 collecting relevant data;
- 1311 b) Documentary evidence is written on paper or recorded electronically and  
1312 includes operating and control procedures, log books, inspection sheets,  
1313 invoices, and analytical results;
- 1314 c) Testimonial evidence is gathered from interviews with technical, operating,  
1315 administrative, or managerial personnel. It provides a context for understanding  
1316 physical and documentary information, but its reliability depends on the  
1317 knowledge and objectivity of the interviewees.

1318  
1319 The more data available, and the more rigorous the review, the more assurance  
1320 validation or verification will provide. Finding the right approach to validation or  
1321 verification is largely influenced by the necessary degree of accuracy and credibility (ie,  
1322 level of assurance) required by the client. For example, companies selling GHG  
1323 emissions reductions or removal enhancements in an emissions trading or carbon  
1324 offsets market will require greater accuracy and credibility than companies seeking  
1325 merely to understand and report on their GHG emissions or removals as part of a  
1326 voluntary GHG scheme.

1327  
1328 Verification testing may include a wide variety of activities, such as retracing data to find  
1329 omissions or transcription errors, re-computing emissions estimates to confirm  
1330 engineering calculations, or reviewing documents attesting to an activity.

1331

**EXAMPLE – Types of verification testing**

Vouching: This test uncovers *errors* in reported GHG information and involves following the paper trail back to the raw data. For example, reported quantities of purchased fuel oil used to calculate CO<sub>2</sub> emissions would be traced back to the accounts payable department to check invoices from the fuel supplier. This process verifies that all reported information is supported.

Re-computation: This test checks for the *accuracy* of arithmetic calculations. This would include, for example, recalculating the results of CO<sub>2</sub> and methane emissions from a flare, where emissions are unlikely to be measured.

Re-tracing data: This test uncovers *omissions* in reported information and involves reviewing the original data records to ensure that all results are appropriately reported. For example, continuously monitored GHG emissions from multiple sources might be reviewed. The verifier would then verify that all the emissions sources were included in the inventory.

Confirmation: This test seeks *written confirmation from objective third parties*. This test may be used when a validator or verifier cannot physically observe a condition, such as the calibration of a flow meter.

1332

1333 **A.5.2 Guidance on quality control**

1334 Quality control measures should include policies and processes for:

- 1335 a) Ensuring independence (applicable only to third party validations or verifications):
- 1336 For third party validations or verifications, the validation or verification body
- 1337 should have adequate procedures for maintaining and monitoring its
- 1338 independence from the responsible party and/or the client;
- 1339 b) Assuring the quality of the validation or verification process: The validation or
- 1340 verification body should implement quality control policies and procedures
- 1341 designed to ensure that all validations or verifications are conducted in
- 1342 accordance with this International Standard or other relevant principles or
- 1343 requirements of a GHG scheme or standard, as specified in the validation or
- 1344 verification criteria. The validation or verification body's general quality control
- 1345 policies and procedures should be communicated to its personnel in a manner
- 1346 that provides reasonable assurance that the policies and procedures are
- 1347 understood, implemented and followed;
- 1348 c) Dispute resolution: The validation or verification body should have procedures
- 1349 and processes in place prior to the commencement of the validation or
- 1350 verification to handle appeals, complaints and disputes brought before it by the
- 1351 client or another affected party. The validation or verification body should be able
- 1352 to demonstrate that, in the functioning of its procedures, the personnel involved
- 1353 in the resolution of such disputes are competent to do so;
- 1354 d) Distribution and application of validation or verification materials: The validation
- 1355 or verification body should have processes and procedures that ensure that the
- 1356 client and/or the responsible party do not use validation or verification reports
- 1357 and statements or certificates for uses other than for which they are intended and
- 1358 within the principles and requirements of any applicable GHG scheme.
- 1359

1360 In most instances, the quality control requirements of the validation or verification body

1361 may be met through an internal peer review process.

1362

1363 **A.5.2.1 Guidance on appointing the validation or verification team**

1364 In deciding the size and composition of the validation or verification team, consideration

1365 should be given to:

- 1366 a) The objectives, scope, criteria and estimated duration of the validation or
- 1367 verification;
- 1368 b) Whether the validation or verification is to be conducted by two or more validation
- 1369 or verification bodies (ie, is it a combined or joint engagement);
- 1370 c) The overall competence of the validation or verification team needed to achieve
- 1371 the objectives of the validation or verification;
- 1372 d) The accreditation, certification or legal requirements of any GHG scheme to
- 1373 which the organization or GHG project subscribes;
- 1374 e) The ability of the team members to interact effectively with the client and the
- 1375 responsible parties and to work together within the agreed scope and objectives
- 1376 of the validation or verification;
- 1377 f) The language(s) to be used during the validation or verification, and an
- 1378 understanding of the organization or GHG project's particular social, cultural and
- 1379 geographical characteristics.
- 1380

1381 These issues may be addressed either by the validation or verification body's own skills  
1382 and competencies or through the support of subcontracted technical or financial expert.  
1383 Trainee validators or verifiers may be included in the validation or verification team under  
1384 the direction and supervision of a competent and qualified team member.  
1385

1386 NOTE - The principles and requirements of some GHG schemes require an institutional  
1387 separation of validation and verification activities between two bodies or at least stipulate  
1388 that different teams from the same validation or verification body conduct the validation  
1389 and verification activities independently of each other to avoid any potential or actual  
1390 conflicts of interest.  
1391

### 1392 **Use of experts**

1393 A validator or verifier should use an expert when his or her subject matter expertise is  
1394 insufficient to appropriately understand and assess significant aspects of the validation  
1395 or verification.  
1396

1397 There are a range of relationships between a validator or verifier and an expert:

- 1398 a) Independent experts: An independent expert is one who takes instruction from  
1399 the validator or verifier and provides information and findings. The expert's  
1400 findings are included in the validator or verifier's working papers and reviewed  
1401 accordingly. Examples of this type of relationship are the:
- 1402 i. Validator or verifier uses a report prepared by an expert for another purpose  
1403 as evidence;
  - 1404 ii. Validator or verifier and the expert perform separate but complementary  
1405 projects in which the expert's work and findings provide evidence for the  
1406 validator or verifier;
  - 1407 iii. Validator or verifier engages an expert to perform specific procedures to  
1408 provide evidence;
- 1409 b) Team member experts: A team member expert is involved in planning,  
1410 decisions, completion of the work and consideration of findings. The expert's  
1411 work and findings are documented as part of the validator or verifier's working  
1412 papers and reviewed accordingly;
- 1413 c) Responsible party experts: The validator or verifier can use experts employed by  
1414 the responsible party; however, the level of assurance provided by a responsible  
1415 party expert is less than that provided by an independent expert or a team  
1416 member expert. The responsible party expert's findings are included in the  
1417 validator's or verifier's working papers and when the validator or verifier assesses  
1418 the findings, the independence of the expert from management responsible for  
1419 the GHG assertion(s) should be considered. Because the validator's or verifier's  
1420 team members need to be independent of the accountable party, it is  
1421 inappropriate for an expert employed by the responsible party to be a member of  
1422 the validation or verification team.  
1423

1424 In evaluating the expert for a particular validation or verification, the validator or verifier  
1425 should consider the:

- 1426 a) Expert's expertise, competence and integrity;
- 1427 b) Relevance of the expert's expertise to the objective of the validation or  
1428 verification;

- 1429 c) Expert's objectivity and appropriate degree of independence in relation to the  
1430 practitioner's and GHG scheme requirements.

1431  
1432 The validator or verifier should be satisfied that there is appropriate understanding  
1433 between the validator or verifier and the expert on their respective roles and  
1434 responsibilities.

1435  
1436 **Roles and responsibilities of the validator or verifier**

- 1437 The validator or verifier should have the ability to:
- 1438 a) Understand the objectives of the expert's work and how it relates to the  
1439 objectives of the validation or verification;
  - 1440 b) Consider and conclude on the reasonableness of the assumptions, methods and  
1441 source data used by the expert;
  - 1442 c) Conclude on the reasonableness and significance of the expert's findings in  
1443 relation to the objective of the validation or verification and the validator's or  
1444 verifier's conclusion.

1445  
1446 The validator or verifier needs to determine how much understanding of the validation or  
1447 verification process, and proficiency in its application, the expert requires based on the  
1448 expert's role in the project.

1449  
1450 **Roles and responsibilities of the expert**

1451 Experts do not need to understand the validation or verification process and techniques  
1452 to the same degree as the validator or verifier. However, they do need to understand the  
1453 objectives and nature of the validation or verification process sufficiently to understand  
1454 their role and to apply professional standards in the context of their responsibilities.

1455  
1456 In relation to using the work of an expert, findings are the output of the work performed  
1457 by the expert that the validator or verifier uses as evidence. In all cases, the findings  
1458 and, if necessary, the work of an expert should be reviewed by the validator or verifier.  
1459 The extent of the review is based on the significance of the expert's involvement, the  
1460 reliability of the evidence the specialist provides, and the validator or verifier's  
1461 assessment of the risk that the specialist's findings may be significantly in error.

- 1462  
1463 The validator or verifier should obtain sufficient appropriate evidence concerning the  
1464 expert's work and findings in order to consider and determine the reasonableness of the:
- 1465 a) Source data used by the expert;
  - 1466 b) Expert's assumptions and methods and, when applicable, their consistency with  
1467 those used in prior periods;
  - 1468 c) Expert's findings.

1469  
1470 The validator or verifier should conclude on the relevance of the expert's findings in  
1471 relation to the objective of the validation or verification and the validator's or verifier's  
1472 overall conclusion on the subject matter.

1473  
1474 Before the validator or verifier accepts the expert's work and findings, the validator or  
1475 verifier needs to exercise professional scepticism and consider the reliability of the

1476 evidence the expert provides, based on the validator or verifier's assessment of the risk  
1477 that the expert's findings may be significantly in error.

1478

### 1479 **Internal peer review**

1480 Current best practice includes the appointment of an internal objective peer reviewer at  
1481 the same time as the appointment of the validation or verification team leader, in order to  
1482 provide expert oversight of the validation or verification process and outcomes. Best  
1483 practice also indicates that validation and verification risk can be significantly reduced  
1484 through the appointment of an objective peer reviewer, who assesses the work of the  
1485 team leader and the validation or verification team from the initial contact with the client  
1486 to the completion of the validation or verification process.

1487

1488 When conducted, the peer review process should be conducted throughout the  
1489 validation or verification process from the appointment of the peer reviewer by the  
1490 validation or verification body at the beginning of the process to the completion of work,  
1491 including the decision to issue the validation or verification statement. The purpose of  
1492 peer review is to ensure that the validation or verification process is conducted with due  
1493 professional care and judgement and that any verification risks are minimised. Peer  
1494 review should focus in particular on the following validation or verification activities:

- 1495 a) Appointment of the validation or verification team leader;
- 1496 b) Strategic review, including initial risk assessment and materiality analysis;
- 1497 c) GHG sample design;
- 1498 d) Validation or verification plan;
- 1499 e) Selection of team members – including competency evaluation;
- 1500 f) The assessment of control environments;
- 1501 g) The draft validation or verification report and statement – including the validation  
1502 or verification findings and conclusions;
- 1503 h) Any non-conformities raised by the validation or verification team, particularly  
1504 those that prohibit an unqualified validation or verification statement;
- 1505 i) The decision to issue the validation or verification statement.

1506

1507 Should any discrepancies come to light during the peer review process, such as new  
1508 errors and omissions or outstanding materiality issues, the peer reviewer should refer  
1509 these issues to the team leader and/or the responsible party as appropriate. Any new  
1510 material discrepancies identified by the peer reviewer must be rectified to the peer  
1511 reviewer's satisfaction before the validation or verification body can issue any validation  
1512 or verification statement or before they certify GHG performance (should this be required  
1513 as a discrete activity).

1514

## 1515 **A.5.3 Guidance on validation and verification scope, objectives and criteria**

1516

### 1517 **Level of assurance**

1518 In a validation or verification, the validator or verifier assesses the evidence collected as  
1519 a result of the process and expresses a conclusion in the form of a validation or  
1520 verification report. It is important to establish at the beginning of the process the degree  
1521 of assurance sought by the client and intended user as it will dictate the extent to which  
1522 the validator or verifier will apply certain procedures to obtain the relative degree of

1523 satisfaction that the evidence supports the level of assurance. In general, there are  
1524 three levels of assurance; high, moderate and none.

1525  
1526 For a high level of assurance, the validator provides a high, but not absolute, level of  
1527 assurance that the management's GHG assertion(s) is free of material misstatement.  
1528 This is expressed positively in the validation or verification report as reasonable  
1529 assurance. The validator or verifier provides a high, though not absolute, level of  
1530 assurance by designing the process and procedures so that in the validator's or verifier's  
1531 professional judgment, the risk of an inappropriate conclusion is reduced to a low level.  
1532 Absolute assurance is not attainable as a result of factors such as the use of judgment,  
1533 the use of testing, the inherent limitations of control and the fact that much of the  
1534 evidence available to the validator or verifier is persuasive rather than conclusive in  
1535 nature. Assurance will also be influenced by the degree of precision associated with the  
1536 GHG estimation or quantification methodology.  
1537

**EXAMPLE – A positive assurance statement (for high level of assurance)**

*Based on the process and procedures conducted, I have reasonable assurance that the management assertion is free from material discrepancies in accordance with the related International Standard on GHG quantification, monitoring and reporting, or to relevant national standards or practices.*

1538  
1539 For a moderate level of assurance, the validator or verifier provides a moderate level of  
1540 assurance that the information subject to review is free of material misstatement. This is  
1541 expressed in the form of negative assurance. The validator or verifier provides a  
1542 moderate level of assurance by designing the process and procedures so that, in the  
1543 validator's or verifier's professional judgment, the risk of an inappropriate conclusion is  
1544 reduced to a moderate level when the evidence obtained enables the validator or verifier  
1545 to conclude the management's assertion is plausible in the circumstances.

1546  
1547 Moderate level validations and verifications are distinguishable from high-level  
1548 validations and verification in that there is less emphasis on detailed testing in a  
1549 moderate level validation or verification and procedures used consist primarily of  
1550 enquiry, analytical procedures and discussions related to GHG information supplied. In  
1551 moderate level validations and verifications, it is essential that the validator or verifier not  
1552 lead the intended user to conclude that a high level of assurance is being provided and  
1553 consequently must use a negative assurance style when expressing a conclusion in the  
1554 validator or verification report.

1555  
1556 The validation or verification report with moderate level of assurance should contain the  
1557 following basic elements, ordinarily in the following layout:

- 1558 a) A title;  
1559 b) The addressee;  
1560 c) An opening or introductory paragraph including:  
1561 i. Identification of the management assertions on which validation or verification  
1562 has been performed;  
1563 ii. A statement of the responsibility of management and the responsibility of the  
1564 validator or verifier;

- 1565 d) A scope paragraph, describing the nature of the processes applied, including:
- 1566 i. A reference to this International Standard or other relevant standards or
- 1567 practices;
- 1568 ii. A statement that a process was limited primarily to inquiries and analytical
- 1569 procedures;
- 1570 iii. A statement that high level of assurance has not been provided, that the
- 1571 process and procedures undertaken were designed for a moderate level of
- 1572 assurance;
- 1573 e) A statement of negative assurance;
- 1574 f) The date of the report;
- 1575 g) The auditor's address;
- 1576 h) The auditor's signature.
- 1577

**EXAMPLE – A negative assurance statement**

*Based on the process and procedures conducted, nothing has come to my attention that causes me to believe that the management assertion is not, in all material respects, in accordance with the related International Standard on GHG quantification, monitoring and reporting, or to relevant national standards or practices.*

1578  
1579 Assistance with compilation of management's assertion on GHG information is  
1580 considered to provide no assurance.

**A.5.3.5 Validation or verification criteria**

1581 Several parties may set validation or verification criteria, including:

- 1584 a) Governments may set specific GHG performance criteria as part of national or
- 1585 regional regulatory requirements;
- 1586 b) GHG emissions trading programmes may contain criteria as part of their eligibility
- 1587 or scheme entry requirements;
- 1588 c) Voluntary reporting initiatives may have set criteria as part of their participation or
- 1589 scheme entry requirements.

**A.5.4 Guidance on strategic review**

1590  
1591 The strategic review process lays the foundation for validation and verification planning  
1592 and provides the first real opportunity for the validation or verification team to assess the  
1593 completeness, consistency, accuracy and transparency of the responsible party's GHG  
1594 information and GHG assertion(s). Strategic review should include an initial risk  
1595 assessment and an analysis of any actual or potential failures that are likely to give rise  
1596 to materiality issues in the responsible party's GHG information and GHG assertion(s).

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**EXAMPLE – Materiality**

The objective of any validation or verification of GHG information is to enable the validation or verification body to express an opinion on whether the organization or GHG project's GHG assertion(s) are prepared, in all material respects, in accordance with the intent of their internal GHG programmes or any GHG scheme to which they subscribe. The assessment of what is material is a matter of professional judgement. The concept of materiality recognizes that some matters, either individually or in the aggregate form, are important if the responsible party's GHG assertion(s) are to be presented fairly in accordance with internal requirements or that of the GHG scheme to which it subscribes.

A misstatement or the aggregate of all misstatements in GHG assertion(s) is considered to be material if, in the light of surrounding circumstances, it is probable that the decision of a person who is relying on the GHG assertion(s), and who has a reasonable knowledge of business and GHG activities (the intended user), would be changed or influenced by such misstatement or the aggregate of all misstatements.

Although the validator or verifier is required to determine materiality based on his or her perception of the needs of intended users of the information, it is extremely difficult to predict with certainty who those users will be or, indeed, the specific needs of known users. Consequently, the materiality decision ultimately becomes a matter for the validator or verifier's professional judgement. In order to ensure consistency and avoid unanticipated discrimination, some GHG schemes or internal programmes assist this decision-making process by including materiality thresholds. These may be defined at the overall level, such as 5% of an organization or GHG project's gross direct GHG emissions. They may also include varying thresholds depending on the level of disaggregation, such as 1% at the gross organizational level, 5% at the facility level and 10% at the source level. Further, a series of discrete errors or omissions identified within a particular disaggregation level, individually less than the materiality threshold may, when taken together, exceed the threshold and thus be considered material. Omissions or errors identified that represent amounts greater than the stipulated threshold are pre-determined as being a "material discrepancy", that is, a non-conformity.

The determination of materiality involves qualitative as well as quantitative considerations. As a result of the interaction of these considerations, misstatements of relatively small amounts could have a material effect on the GHG assertion(s).

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**Information and documentation**

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In addition to documentation identified in Clause 5.4, validators and verifiers may find it useful to review the following information if available:

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a) A GHG information flow diagram;

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b) An annotated process flow diagram, characterizing mass  $\sigma$  energy flows for selected GHG sources and sinks;

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c) A mass balance, energy balance and/or other quantitative balance for selected GHG sources and sinks;

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d) Findings from any industry, organization or GHG project internal assessments or audits;

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e) Prior GHG validations or verifications that relate to the organization or GHG project's GHG information management process and systems, or the quality of its GHG information;

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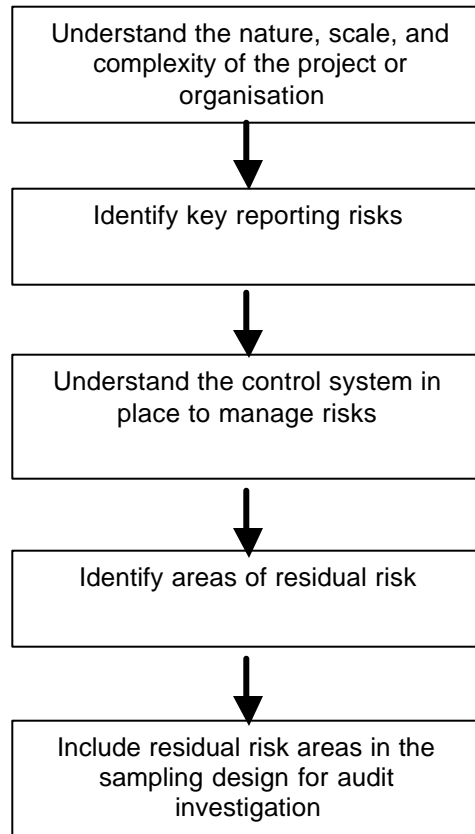
f) The (non) existence of an operating environmental management system and its application in the quantification, monitoring and reporting of GHG emissions and removals.

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1625 **A.5.5 Guidance on GHG information sample design**

1626 It is generally inefficient to assess all GHG information collected by the organisation or  
1627 project, therefore a risk-based approach should be used to determine the sample design  
1628 for further audit investigation. Typical steps in a risk based approach follow:  
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1632 Examples of reporting and control risks include:

- 1633 a) Incompleteness: for example, exclusion of significant sources, incorrectly defined  
1634 boundaries, leakage effects
- 1635 b) Inaccuracy: for example, double accounting, significant manual transfer of key  
1636 data, inappropriate use of emission factors)
- 1637 c) Inconsistency: for example, not documenting methodology changes in calculating  
1638 emissions from those used in previous years)
- 1639 d) Data management and control weaknesses: for example, no checking of manual  
1640 transfers of data from the point of origin and between calculation spreadsheets,  
1641 no internal audit/review process, inconsistent monitoring, no calibration and  
1642 maintenance of key process parameters/measurements e.g. metering and  
1643 sampling/analysis

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**EXAMPLE - Risk-based approach for project validation**

The risk based approach for validation should identify the key risks associated with the assumptions made and GHG information used within the:

- Project design;
- Baseline determination (eg, scenario, methodology, estimation and additionality (when applicable));
- Project and baseline GHG quantification procedures;
- GHG emission reduction or removal enhancement estimates;
- Quality and monitoring plans or procedures;
- Environmental impact analysis (if applicable)

The two main sources for uncertainties in estimating GHG emission reductions or removal enhancements from GHG projects are normally:

- **Baseline uncertainty.** There are uncertainties associated with the counterfactual assumptions made for the baseline when projecting a set of circumstances that may never occur (eg, baseline technology/fuel, performance of baseline technology, timing of replacement/length of timeframe, equivalence of services);
- **Data uncertainty.** The technical uncertainties associated with the determination and the measurement of the parameters necessary to estimate the GHG emission reductions or removal enhancements (eg, output, efficiency of plant/networks, emission factor, utilisation factor). There may also be accidental reporting errors that are related to human error or problems in the reporting routines.

The baseline potentially creates the greatest uncertainty in the GHG emission reduction or removal enhancement estimates, as it inherently projects a set of circumstances that never occur. The uncertainty associated with the assumptions made for the baseline can never be completely removed. Lacking appropriate means for quantifying this type of uncertainty, the most conservative, yet reasonable baseline should be selected.

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In addition, to a risk-based approach there are a number of selection methods that are commonly used in combination to determine the GHG information sampling design.

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Methods include samples based on:

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a) GHG sources;

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b) GHG sinks;

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c) GHG types;

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d) Organizations, facilities, sites;

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e) GHG projects;

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f) GHG processes.

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Sample design should be treated as an iterative process, as the sampling approach or the information samples chosen may need to be changed, as weaknesses in control environments, GHG information and materiality issues are identified during the validation or verification. Revisions to the sample design should consider the sufficiency and appropriateness of evidence from testing methodologies together with any control evidence to support the organization or GHG project's GHG assertions.

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**A.5.6 Guidance on preparation for the validation or verification**

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It is generally inefficient to collect and assess all organization and GHG project GHG information. Therefore, a risk-based approach is used to design the validation or verification plan. The process of designing the validation or verification plan consists of:

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- 1670 a) An initial assessment of the findings of the strategic review process to  
1671 understand the root causes of any identified or potential GHG information errors,  
1672 omissions, materiality issues or failures and weaknesses in control environments;  
1673 b) Reference and consideration of any previous validation or verifications, and/or  
1674 comparable validations or verifications of similar organizations or GHG projects;  
1675 c) The sample design, including the rationale behind the approach being taken;  
1676 d) Identification of the types of potential material misstatements that could occur in  
1677 the GHG assertion(s);  
1678 e) Consideration of risks that could cause material misstatements;  
1679 f) Design of appropriate methodologies to test whether material misstatements  
1680 have occurred or errors or omissions have been made;  
1681 g) Amendment of the validation or verification plan throughout the validation or  
1682 verification process to take account for any new evidence relating to actual or  
1683 potential errors, omissions, materiality issues and the prevailing performance of  
1684 the control environment(s).

1685

1686 The risks considered in the validation or verification plan are:

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a) Inherent risk;

1688

b) Control risk;

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c) Detection risk.

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1691 Matters to be considered by the validation or verification team in developing the overall  
1692 validation or verification plan should include findings from the strategic review and:

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a) The validation or verification body's knowledge of the responsible party's  
1694 business, including:

1695

i. The industry conditions affecting the organization or GHG project's reporting  
1696 of GHG emissions, removals, emission reductions or removal enhancements  
1697 and levels of disclosure;

1698

ii. The characteristics of the organization or GHG project, its business, its GHG  
1699 performance and its GHG reporting requirements, including changes since  
1700 the validation or the previous verification period;

1701

iii. External reporting requirements for GHG information;

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iv. The robustness and maturity of the prevailing control environments;

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v. The general level of competence of the organization or GHG project's  
1704 management and those responsible for the gathering, transferring,  
1705 processing, analyzing, aggregating, disaggregating, storing and reporting of  
1706 the GHG information that supports the GHG assertion(s).

1707

b) Understanding the GHG information collection and internal control systems,  
1708 including:

1709

i. The validation or verification body's cumulative knowledge of a range of  
1710 different GHG information collection and internal control systems and the  
1711 relative emphasis expected to be placed on tests of control and substantive  
1712 procedures according to the approach taken by the responsible party.

1713

c) Risk assessment and materiality analysis, including:

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i. The assessment of inherent and control risks; and the potential for detection  
1715 risks to occur;

1715

ii. The setting of materiality levels for reporting purposes;

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- 1717           iii. The possibility of material misstatement, including the experience of past  
1718           periods;
- 1719           iv. Identification of complex GHG quantification requirements (eg, where the use  
1720           of complicated conversion factors or methodologies are likely to lead to  
1721           variability in GHG information by the organization or GHG project);
- 1722           v. Determining access to, and availability of, relevant, recognized and up-to-  
1723           date external emissions factors.
- 1724       d) Coordination, direction, supervision and review, including:
- 1725           i. The number of validation or verification components (eg, the number of  
1726           facilities, GHGs, manufacturing processes, control environments, computer  
1727           information systems, subsidiaries, branches and divisions);
- 1728           ii. The involvement of technical and financial experts and the importance of their  
1729           contribution to the overall validation or verification process;
- 1730           iii. Number, roles and responsibilities of team members;
- 1731           iv. Number of different disciplines and/or competencies required to undertake an  
1732           effective validation or verification process.
- 1733       e) Other matters, including:
- 1734           i. Conditions requiring special attention, such as the existence of third parties,  
1735           joint ventures or outsourcing arrangements;
- 1736           ii. The terms of the contract with the client (eg, timescales for delivery) and any  
1737           GHG scheme responsibilities and competency requirements;
- 1738           iii. The nature and timing of reports or other communications with the client, the  
1739           responsible parties or the intended users of the information, including the  
1740           administrators of any GHG schemes to which they subscribe;
- 1741           iv. The frequency with which the validation or verification has to be conducted to  
1742           satisfy internal client requirements, the needs of regulators and other  
1743           stakeholders and any GHG schemes to which the organization or GHG  
1744           project subscribes.

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### **Conducting an opening meeting**

1747       In many instances, for example internal GHG information validation or verification in a  
1748       small organization, the opening meeting may simply consist of communicating that a  
1749       validation or verification is being conducted and explaining the nature of the validation or  
1750       verification.

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1752       For other validation or verification situations, the meeting should be formal and records  
1753       of attendance should be kept. The validation or verification team leader should chair the  
1754       meeting and the following items, as appropriate, should be considered:

- 1755           a) Introduction of the participants, including an outline of their roles;
- 1756           b) Confirmation of the validation or verification objectives, scope and criteria;
- 1757           c) Confirmation of the validation or verification timetable and other relevant  
1758           arrangements with the client and/or the responsible party, such as the date and  
1759           time for the closing meeting, any interim meetings between the validation or  
1760           verification team and the client's management, and any late changes;
- 1761           d) Methods and procedures to be used to conduct the validation or verification,  
1762           including advising the client that the validation or verification evidence will only be  
1763           based on a sample of the information available and that therefore there is an  
1764           element of uncertainty in the validation or verification;

- 1765 e) Confidentiality issues and procedures;
- 1766 f) Confirmation of formal communication channels between the validation or
- 1767 verification team and the client and/or the responsible party;
- 1768 g) Confirmation of the language to be used during the validation or verification;
- 1769 h) Confirmation that, during the validation or verification, the client and/or the
- 1770 responsible party will be kept informed of validation or verification progress;
- 1771 i) Confirmation that the resources and facilities needed by the validation or
- 1772 verification team are available;
- 1773 j) Confirmation of information and data access;
- 1774 k) Confirmation of relevant site access, work safety, emergency and security
- 1775 procedures for the validation or verification team;
- 1776 l) Confirmation of the availability, roles and identities of any guides;
- 1777 m) The method of reporting, including any grading of nonconformities;
- 1778 n) Information about conditions under which the validation or verification may be
- 1779 terminated or suspended;
- 1780 o) Information about any appeal system on the conduct or conclusions of the
- 1781 validation or verification;
- 1782 p) Opportunity for the responsible party to ask any questions.

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#### **A.5.7 Guidance on assessment against internal and GHG scheme principles and requirements**

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*To be completed.*

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#### **A.5.8 Guidance on the assessment of internal control environment**

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*To be completed.*

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##### **A.5.8.1 Guidance on assessment of control environment**

1791

A wide variety of activities characterize the organization's or GHG project's control environment. Key aspects are discussed below.

1792

1793

##### **Management philosophy and operating style**

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Management philosophy and operating style covers a broad range of characteristics which include:

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a) Integrity and ethical values;

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b) Approach to taking and monitoring GHG risks;

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c) Attitudes and actions concerning GHG reporting;

1802

d) Emphasis on meeting GHG and other related financial and operating goals.

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These characteristics significantly influence the control environment, particularly when one or a few individuals, regardless of other control environment factors, dominate management.

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##### **Methods of assigning authority and responsibility**

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Methods of assigning authority and responsibility affect the understanding of GHG reporting relationships established within an organization or GHG project. Information to consider includes:

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- 1813 a) Organization or GHG project policy on matters such as acceptable business  
1814 practices, conflicts of interest and codes of conduct;  
1815 b) Assignment of responsibility and delegation of authority to deal with matters such  
1816 as organizational goals and objectives, operating functions and regulatory  
1817 requirements;  
1818 c) Employee job descriptions specifying duties, reporting relationships and  
1819 constraints;  
1820 d) Computer systems documentation indicating procedures for authorizing GHG  
1821 transactions and approving systems changes.  
1822

### **Management control methods**

1823 Management control methods affect management's direct control over the exercise of  
1824 authority delegated to others and its ability to effectively supervise the organization's  
1825 activities. Such methods include consideration of:  
1826

- 1827 a) Establishing planning and reporting systems that set forth management's plans  
1828 and the result of actual performance;  
1829 b) Establishing methods that report actual performance and exceptions from  
1830 planned performance, and communicating this information to appropriate levels  
1831 of management;  
1832 c) Using such methods at appropriate management levels to investigate variances  
1833 from expectations and to take appropriate and timely corrective action.  
1834

### **Systems development methodology**

1835 Systems development methodology involves establishing and maintaining  
1836 methodologies for developing and modifying systems and procedures, including related  
1837 computer programs and data files.  
1838

### **Personnel policies and practices**

1839 Personnel policies and practices affect an organization's ability to employ sufficient  
1840 competent people to meet its goals. Specifically, they include policies and practices for  
1841 hiring, training, evaluating, promoting and compensating employees, and for giving them  
1842 the resources necessary to carry out their assigned responsibilities.  
1843  
1844

### **Management reaction to external influences**

1845 External influences are established and exercised by outside forces and affect the  
1846 organization's operations and practices. Examples include monitoring and compliance  
1847 requirements imposed by legislative and regulatory bodies. Ordinarily, such influences  
1848 are outside an organization's authority. However, they may heighten management's  
1849 consciousness of an attitude toward conducting and reporting an organization's  
1850 operations. They may also prompt management to establish specific policies and  
1851 procedures. They may also prompt management to establish specific policies and  
1852 procedures.  
1853

### **Internal audit**

1854 Internal audit is an activity within the control environment that functions by measuring  
1855 and evaluating, as a service to the organization, the effectiveness of other activities.  
1856 Internal auditors are responsible for providing analyses, evaluations, recommendations  
1857 and other information to the organization's management and board of directors, or to  
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1860 others with equivalent authority and responsibility. In performing these functions, internal  
1861 auditors are part of internal control.

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1863 **A.5.8.2 Guidance on the assessment of GHG information management system**

1864 *To be completed.*

1865  
1866 **A.5.8.3 Guidance on the assessment of control procedures**

1867  
1868 **General control procedures**

1869 General control procedures consist of how the organization or GHG project determines:

- 1870 a) Capable personnel: One of the most important aspects of the control procedure  
1871 is to ensure that capable personnel are performing the work. A high turnover in  
1872 personnel maybe indicative of a control procedure weakness;
- 1873 b) Segregation of responsibilities: The segregation of responsibility, or division of  
1874 duties, is important in ensuring that incompatible responsibilities do not create  
1875 the need or ability to create or conceal errors;
- 1876 c) Control access: Access to important records should be limited to authorised  
1877 personnel;
- 1878 d) Periodic comparison: Those who do not have responsibility for recording the  
1879 GHG information should perform periodic comparison.

1880  
1881 **Error checking routines**

1882 There are numerous methods for checking GHG information that can be categorised into  
1883 input, transformation and output controls (Table A1). Input controls are procedures for  
1884 checking the data from the measured or quantified values to a hard copy.  
1885 Transformation controls refer to error checking during the process of collating,  
1886 transferring, processing, calculating, estimating, aggregating, disaggregating or adjusting  
1887 input data. Output control refers to control surrounding the distribution of GHG  
1888 information and comparisons between input and output information.

1889  
1890 **Table A1: Examples of error checking tests and controls**

Error checking categories	Possible error checking tests and controls
Input	<ul style="list-style-type: none"> <li>• Record count test</li> <li>• Valid character tests</li> <li>• Missing data tests</li> <li>• Limits and reasonableness tests</li> <li>• Error resubmission controls</li> </ul>
Transformation	<ul style="list-style-type: none"> <li>• Blank tests</li> <li>• Consistency tests</li> <li>• Cross-checking tests</li> <li>• Limits and reasonableness tests</li> <li>• File controls</li> <li>• Master file controls</li> </ul>
Output	<ul style="list-style-type: none"> <li>• Output distribution controls</li> <li>• Input/Output tests</li> </ul>

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1892 **A.5.8.4 Guidance on the assessment of other controls**

1893 *To be completed.*

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1895 **A.5.8.5 Guidance on computer information systems**

1896 *To be completed.*

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1898 **A.5.9 Guidance on assessment of GHG information**

1899 The degree of inherent accuracy and reliability that can be attributed to GHG information  
 1900 will depend on the data source and the ways in which the GHG information has been  
 1901 collected, calculated, transferred, processed, analyzed, aggregated or disaggregated  
 1902 and stored. The categorization of GHG information sources may help validators or  
 1903 verifiers to understand how much they can depend on the accuracy or reliability of GHG  
 1904 information from different sources.

1905

1906 Table A2 illustrates the relationship between GHG information types and sources and  
 1907 relative accuracy. There is a tendency for greater accuracy and precision as you  
 1908 advance up the tiers; although this may vary qualitatively depending on the specifics of  
 1909 any given validation or verification. It should be noted that few GHG emissions are  
 1910 directly measured and most are obtained through emissions factors or the use of  
 1911 models.

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**Table A2 – Relationship between GHG information types and sources and relative accuracy**

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GHG information type or source	Relative Level of Accuracy
Continuous direct measurement	Highest Accuracy
Site-specific correlations	↑
Intermittent (periodic) direct measurement	↓
Use of models	↓
Use of default emissions factors	Lowest Accuracy

1915

1916 Table A3 lists typical information to review in verifying GHG emissions and removals  
 1917 depending on emissions and removal categories and GHG quantification methodologies.

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**Table A3 - Typical information to review in verifying GHG emissions and removals estimates**

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GHG Emission and removal categories	Information requirements
Combustion	<ul style="list-style-type: none"> <li>• Fuel type</li> <li>• Quantity of fuel consumed</li> <li>• Type(s) of GHGs emitted</li> <li>• Combustion efficiency</li> <li>• Global warming potentials for each GHG</li> <li>• Calibration of equipment</li> </ul>

GHG Emission and removal categories	Information requirements
Process	<ul style="list-style-type: none"> <li>• Emissions source</li> <li>• Hours of operation or quantity of output</li> <li>• Uncontrolled GHG emissions (and their emission factors)</li> <li>• Control equipment efficiency and reliability</li> <li>• Net emissions per hour of output or unit of product</li> <li>• Chemical analytical laboratory methods and records</li> <li>• Results from continuous emissions monitoring</li> </ul>
Fugitive	<ul style="list-style-type: none"> <li>• Stream compositions</li> <li>• Leak test results or maintenance practices</li> <li>• Types of equipment and equipment counts</li> <li>• Emissions history</li> <li>• Chemical Analytical laboratory methods and records</li> </ul>
Emissions from imported/exported energy	<ul style="list-style-type: none"> <li>• Generating sources</li> <li>• Greenhouse gases generated as a function of kilowatt hours generated</li> <li>• Transmission and distribution losses</li> <li>• Kilowatt hours consumed</li> <li>• Steam and heat</li> </ul>
Biological Sinks	<ul style="list-style-type: none"> <li>• Carbon pools definitions and assumptions</li> <li>• Sampling methodologies</li> <li>• Growth models</li> <li>• Biomass/carbon models</li> <li>• Spatial boundary</li> </ul>

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In addition to checking GHG emission sources under standard operating environments or normal conditions, validators and verifiers should assess emissions from unusual circumstances such as start up, shut down, emergency or new procedures outside the normal operating range of the facility or GHG project.

**Crosschecking GHG information**

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In many cases the quantification of GHGs may be done in more than one way and/or there may be other sources of raw data. These may be used to ‘cross-check’ GHG quantifications to provide greater assurance that the reported information is within the expected range.

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Types of crosschecks may include:

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- a) Internal checks within a process;
- b) Internal checks within an organization;
- c) Checks within a sector;
- d) Checks against international information.

**EXAMPLE - Crosschecking GHG information: A coal-fired electricity generator**

A generation company owns 3 plants at Sites A, B and C.

As part of plant operational control at Site A, the mass of coal injected is measured continually; the carbon and energy content of the coal is sampled regularly; and the fly ash mass and deposited carbon is measured regularly. From this information and stoichiometric mass balance equations, the mass of CO<sub>2</sub> emitted can be calculated.

**Crosscheck 1:** The generator measures MegaWatts (MWh) of electricity produced as part of operational control, and from previous data (eg, last year's accounts) the company will have an estimate of tCO<sub>2</sub>/MWh produced. This is checked against current intensity, and any significant departures investigated. Further, manufacturers specifications state expected outputs under known maintenance conditions, and this can be used as a 2nd internal check, with significant departures investigated.

**Crosscheck 2:** At Site B, the company has compiled similar information, and can check whether Site A and Site B emissions are comparable. Site B may be a different plant design, and/or use a different feedstock, but the company will know that Site B is typically 4% more emission intensive than Site A. Any significant departures from this difference in current calculations can be investigated for Site A and Site B.

**Crosscheck 3:** The company operates within a national grid, and the national grid operating authority produces annual intensity figures for each region within the grid. The company can check whether Sites A, B and C are close to their regional average, and any significant departures investigated or explained.

**Crosscheck 4:** International bodies such as the IPCC produce typical emission intensity figures for known technologies. These can be used to check the approximate magnitude of the calculated emissions for Sites A, B and C, and any significant departures explained or investigated.

**NOTE** - None of these crosschecks on their own are a substitute for source data, but they are all useful in detecting gross errors, and highlighting any areas in the quantification procedures, which may be unusual or may introduce higher risk. Having these crosschecks provides greater assurance.

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**A.5.10 Guidance on assessment of the GHG assertion**

**Qualifying the validation or verification statement**

Although circumstances that require the validator or verifier to qualify the validation or verification statement vary considerably, they can be categorized in two groups:

- a) The GHG assertion(s) is affected by a departure from the requirements specified by the GHG scheme, including:
  - i) An inappropriate treatment (eg, incorrect global warming potentials applied during the reporting period);
  - ii) An inappropriate estimation or quantification of a GHG source or sink in the GHG assertion(s) (eg, overestimation of carbon stocks);

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- iii) A failure to disclose essential information or to present information in an appropriate manner (eg, inadequate explanation of the permanence of a carbon sink).
  - b) The validator or verifier is unable to obtain sufficient appropriate evidence to determine whether there has been a departure from the requirements specified by the GHG scheme. These are circumstances where the validator or verifier has not been able to apply all the tests and procedures considered necessary in the circumstances. The result is that there is not sufficient appropriate evidence to form an opinion as to whether the GHG assertion(s) is presented fairly in accordance with requirements of the GHG scheme. Such limitations may arise in a number of situations, including:
    - i) Circumstances related to the timing of the validator's or verifier's work (eg, a verification conducted during unplanned maintenance leading to an inability to observe operational practices or monitoring equipment in operation);
    - ii) Circumstances beyond the control of the organization or GHG project, or the validator or verifier (eg, destruction of GHG information in a fire);
    - iii) A limitation imposed or created by the organization or GHG project (eg, failure to maintain adequate GHG records).

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When there is a departure from the requirements of the GHG scheme or a scope limitation, the validator or verifier must decide what type of qualification or modification to the validation or verification statement is appropriate. In addition to materiality, the validator or verifier should consider:

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- a) The degree to which the matter impairs the usefulness of the GHG assertion(s);
  - b) The extent to which the effects of the matter on the GHG assertion(s) can be determined;
  - c) Whether the GHG assertion(s) is, or may be, misleading even when read in conjunction with the validator's or verifier's statement.

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A qualified validation or verification statement, when read in conjunction with the GHG assertion(s), normally will serve adequately to inform the intended user of any deficiencies or possible deficiencies in the GHG assertion(s).

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When the validator or verifier concludes that a qualification is necessary, the validation or verification statement should clearly draw attention to the qualification by modifying the validation or verification statement. The statement should include:

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- a) A qualification paragraph, inserted between the scope and opinion paragraphs of the statement, that includes:
    - i. All qualifications;
    - ii. An adequate explanation of the reasons for each qualification;
    - iii. A clear indication of how and, when reasonably determinable, to what extent the GHG assertion(s) are or may be affected;
    - iv. If the affect on the GHG assertion(s) of the matter causing the qualification is not reasonably determinable, a statement of such and reasons for the determination.
  - b) The opinion paragraph should include:
    - i) Wording appropriate for the type of qualification(s);
    - ii) A reference to the qualification paragraph.

2005 In addition, when the qualification results from a limitation in the scope, the scope  
2006 paragraph should contain a reference to the qualification paragraph.

2007  
2008 **Adverse validation or verification statements**

2009 When, in the judgment of the validator or verifier, a qualification is not appropriate, an  
2010 adverse validation or verification statement can be issued (eg, the GHG assertion(s) is  
2011 not presented fairly in accordance with GHG scheme requirements) or the validator or  
2012 verifier can issue a statement that states the validator or verifier was unable to obtain  
2013 sufficient appropriate objective evidence to form an opinion as to whether the GHG  
2014 assertion(s) are presented fairly in accordance with the GHG scheme requirements.

2015  
2016 **A.5.11 Guidance on the completion of validation and verification**

2017  
2018 **Working papers, audit trails and document control and management**

2019 The validation or verification team should document matters that are important in  
2020 providing evidence to support the validation or verification statement and evidence that  
2021 the validation or verification was carried out in accordance with the agreed scope and  
2022 objectives of the validation or verification and any relevant principles or requirements of  
2023 GHG schemes or standards.

2024  
2025 The validation or verification team should prepare documentation that is sufficiently  
2026 complete and detailed to provide an overall understanding of the process. As  
2027 appropriate, the validation or verification team should consider producing and recording  
2028 the following kinds of documents and validation or verification evidence.

2029  
2030 Background

- 2031 a) The organization or project's GHG assertion(s);  
2032 b) Information concerning the industry, GHG reporting environment and legislative  
2033 environment within which the organization or GHG project operates;  
2034 c) Information concerning organizational boundaries of the organization or GHG  
2035 project;  
2036 d) Information on the identification and selection of GHG sources and sinks;  
2037 e) Procedures for quantifying of GHG emissions, removals, emission reductions or  
2038 removal enhancements;  
2039 g) An annotated process flow diagram, characterizing mass or energy flows for  
2040 selected GHG sources and sinks;  
2041 f) A mass balance, energy balance and/or other quantitative balance for selected  
2042 GHG sources and sinks;  
2043 g) Extracts or copies of important agreements, contracts and, where applicable,  
2044 emissions trading and carbon offset records.

2045  
2046 Validation or verification process

- 2047 a) Evidence of the planning process, including details of the anticipated and actual  
2048 objectives, scope, criteria and activities to be undertaken within the validation or  
2049 verification programme;  
2050 b) Details of the GHG information sampling plan, including explanations and  
2051 justifications for the approach taken during the validation or verification and the  
2052 methodologies used;

- 2053 c) Details of the reported GHG information that was validated or verified, including  
2054 any relevant supporting information that may be required to verify consistency in  
2055 future validations or verifications;  
2056 d) Evidence that the validation or verification team has a clear understanding of the  
2057 organization or GHG project's GHG information management and internal control  
2058 systems;  
2059 e) Records relating to validation or verification team personnel, including  
2060 validator/verifier competence and performance evaluation, team selection and  
2061 maintenance and improvement of competence;  
2062 f) Results of the strategic review, risk assessment and materiality analysis;  
2063 g) Analyses of significant ratios and trends in the GHG information and, including  
2064 those that may influence changes in the level of GHG performance;  
2065 h) Evidence of inherent and control risk assessments;  
2066 i) Analyses of GHG information inputs, quantification and aggregation and  
2067 disaggregation methodologies;  
2068 j) A record of the nature, timing and extent of activities performed (including the  
2069 use of any experts) and the results of such activities, including the analytical  
2070 testing undertaken and significant validation and verification trails followed and  
2071 the reasoning behind them;  
2072 k) A record of who completed the activities, when they were performed and how  
2073 these activities contributed to the validation or verification findings and  
2074 conclusions;  
2075 l) The validation or verification team's reasoning and rationale on all significant  
2076 matters that require the exercise of professional judgement;  
2077 m) Any changes made to the validation or verification plan and associated activities  
2078 and analytical testing as a result of evidence obtained;  
2079 n) The results and findings of the validation or verification;  
2080 o) Conclusions reached by the validation or verification team concerning significant  
2081 aspects of the validation or verification, including how exceptions and unusual  
2082 matters, if any, were resolved or treated. If the client made changes to original  
2083 GHG assertion(s) and GHG information in order to reduce or remove the risk of  
2084 material misstatement within their GHG information, reasons should be recorded.  
2085

2086 Communication and reporting

- 2087 a) Copies of written communications with the client, experts and other stakeholders;  
2088 b) Notes of significant verbal communications with the client, experts and other  
2089 stakeholders;  
2090 c) Copies of notes of significant verbal communications and written communications  
2091 with all parties involved in the validation or verification, including the terms of the  
2092 validation or verification and material weaknesses in internal control;  
2093 d) Any non-conformities raised and their associated preventive and corrective  
2094 action programmes, including situations where omissions or errors are  
2095 considered material, resulting in amendments to the original GHG information;  
2096 e) Validation or verification follow-up reports (if applicable);  
2097 f) Copies of the responsible party's GHG assertion(s) reported to the GHG scheme  
2098 and the validation or verification report and statement (where appropriate);  
2099 g) Confidentiality, safe custody, retention and ownership of validation or verification  
2100 documentation.

2101 The validation or verification body should adopt appropriate procedures for maintaining  
2102 the confidentiality and safe custody of the validation or verification documentation and  
2103 for retaining them for a period sufficient to meet the needs of the client, the responsible  
2104 parties, the GHG scheme(s) to which they subscribe and in accordance with legal and  
2105 professional requirements of record retention.

2106  
2107 Validation or verification documentation remains the property of the validation or  
2108 verification body. Although portions of, or extracts from, the validation or verification  
2109 documentation may be made available to the client and/or organization or GHG project  
2110 (or, where specific disclosure requirements exists, any GHG schemes to which they  
2111 subscribe), at the discretion of the validation or verification body. Such disclosed  
2112 documentation should not be considered as a substitute for the organization or GHG  
2113 project's GHG records.

2114  
2115 NOTE - The release of any information should be agreed with the client and/or the  
2116 responsible party depending on the scope and objectives of the validation or verification  
2117 and the GHG scheme rules under which the validation or verification is taking place.

2118  
2119

#### **A.5.12 Guidance on the validation report**

2120 *To be completed*

2121  
2122

#### **A.5.13 Guidance on the validation and verification statement**

2123 The validation or verification statement should include the following elements:

- 2124 a) Title;
- 2125 b) Name, address and other relevant contact information for the responsible party  
2126 and/or the client;
- 2127 c) Opening or introductory paragraph containing:
- 2128 i) Identification of the organization or GHG project's GHG assertion(s) against  
2129 which the validation or verification testing was conducted;
- 2130 ii) A statement of the roles and responsibilities of the organization or GHG  
2131 project's management and the roles and responsibilities of the verification or  
2132 validation body.
- 2133 d) A scope paragraph containing:
- 2134 i) Reference to the principles and requirements of relevant GHG schemes or  
2135 standards against which the validation or verification was conducted;
- 2136 ii) Reference to the validation or verification scope, objectives and criteria  
2137 agreed with the client, including the level of assurance required;
- 2138 iii) A description of the work the validation or verification team performed,  
2139 including the techniques and processes used to test the GHG information and  
2140 associated GHG assertion.
- 2141 e) Opinion paragraph containing:
- 2142 i. A reference to the GHG reporting framework and/or GHG scheme  
2143 requirements (as appropriate) used to prepare the GHG assertion(s);
- 2144 ii. GHG information or performance validated or verified (eg, GHG emissions,  
2145 removal, emission reductions, removal enhancements);
- 2146 iii. The level of assurance provided by the validation or verification, in line with  
2147 the agreed validation or verification scope, objectives and criteria;

- 2148           iv. An expression of opinion on the GHG assertion(s), including any limitations or  
2149                 qualifications to the opinion (eg, as a result of a GHG project that is still at the  
2150                 planning stage).  
2151           f) The date of the validation or verification statement;  
2152           g) The validation or verification body's contact details;  
2153           h) An authorised signature from the validation body.  
2154

2155           A measure of uniformity in the form and content of the validation or verification statement  
2156           is desirable because it helps to promote the reader's understanding and to identify  
2157           unusual circumstances when they occur.  
2158

2159           The following additions may be added to the validation or verification statement to  
2160           provide further clarity:

- 2161           a) The credentials of the validation or verification body to add credibility to the  
2162                 assurance;  
2163           b) The degree to which the validation or verification body is independent of the  
2164                 client, the responsible party and the subject matter;  
2165           c) If there are reports from two or more validation or verification bodies, their  
2166                 respective responsibilities.  
2167

2168           NOTE - The validation or verification body should produce a draft validation or  
2169           verification statement to be sent to the client and/or the responsible party to review for  
2170           factual correctness. If the responsible party is satisfied that the validation or verification  
2171           statement is factually correct then the validation or verification body is able to release the  
2172           validation or verification statement in final form. If the responsible party requires any  
2173           significant amendments to be made to the draft statement then the revised content has  
2174           to be agreed with the team leader prior to publication.  
2175

2176           **A.5.14       Guidance on certification of GHG performance**

2177           *To be completed*  
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## Annex B (informative)

### Guidance on skills and competencies for validators and verifiers

Annex B provides guidance on the skills and competencies required of validators and verifiers to effectively conduct validation and verification requirements contained in Clause 5 of this International Standard. Annex B is informative and does not include mandatory requirements.

#### General guidance on the skills and competencies for validators and verifiers

The validation or verification body should ensure that personnel involved in validation or verification work be competent for the functions they perform. In the validation or verification of GHG information, the personnel involved are likely to include those who:

- a) Manage the validation or verification process;
- b) Assess new and continuing clients, including making the decision to accept or decline the client;
- c) Select and verify the competence of validators or verifiers to conduct the validation or verification;
- d) Brief team members and arrange any necessary training;
- e) Assess applications from clients and conduct the strategic review;
- f) Undertake the validation or verification activities;
- g) Review validation or verification reports, working papers and associated supported evidence from the validation or verification process;
- h) Make the decisions on validation or verification and the validation or verification statement;
- i) Manage the storage of records and information;
- j) Set-up and operate a procedure for complaints, disputes and appeals.

#### Personal attributes of validators and verifiers

Validation or verification team members should possess personal attributes to enable them to act in accordance with the principles of validation or verification described in Clause 4.

A validation or verification team member should be:

- a) Ethical (ie, fair, truthful, sincere, honest and discreet);
- b) Open-minded (ie, willing to consider alternative ideas or points of view);
- c) Diplomatic (ie, tactful in dealing with people);
- d) Observant (ie, actively aware of physical surroundings and activities);
- e) Perceptive (ie, instinctively aware of and able to understand situations);
- f) Versatile (ie, adjusts readily to different situations);
- g) Tenacious (ie, persistent, focused on achieving objectives);
- h) Decisive (ie, reaches timely conclusions based on logical reasoning and analysis);
- i) Self-reliant (ie, acts and functions independently while interacting effectively with others).

2226 **Composite knowledge and skills requirements for the validation or verification**  
2227 **team**

2228  
2229 The validation or verification team should consist of one or more team leaders, together  
2230 with an appropriate combination of validators or verifiers and/or independent experts as  
2231 appropriate to the agreed scope of the validation or verification.  
2232

2233 All validation or verification team members involved in the validation or verification  
2234 should be familiar with:

- 2235 a) The subject matter relating to the scope of the validation or verification;
- 2236 b) The legal rules under which the validation or verification is being undertaken (eg,  
2237 the parameters of any legal documents or contracts agreed between the GHG  
2238 scheme administrators and the responsible party);
- 2239 c) Any specific principles or requirements of the GHG scheme or standard that fall  
2240 within the scope of the validation or verification;
- 2241 d) Any accreditation requirements incumbent on the validation or verification body  
2242 conducting the work;
- 2243 e) The industrial processes that generate GHG emissions and the technical issues  
2244 associated with their quantification, monitoring and reporting;
- 2245 f) The biological systems that affect GHGs removals and the technical issues  
2246 associated with their quantification, monitoring and reporting;
- 2247 g) GHG emission or emission reduction quantification, monitoring and reporting  
2248 methodologies used by the organization or GHG project;
- 2249 h) GHG removal or removal enhancement quantification, monitoring and reporting  
2250 methodologies used by the organization or GHG project;
- 2251 i) Data and information auditing and sampling methodologies;
- 2252 j) Risk assessment methodologies and materiality analysis approaches;
- 2253 k) The validation or verification body's procedures (administrative and otherwise) for  
2254 the performance of the validation or verification work.  
2255

2256 At least one validation or verification team member should have detailed knowledge of  
2257 each of the above areas based on relevant working experience.  
2258

2259 In addition to the above, the validation or verification team should collectively have  
2260 experience, training and up-to-date knowledge of:

- 2261 a) The activities required to identify failures in GHG reporting systems and decide  
2262 on its impact on the organization or GHG project's GHG assertion(s);
- 2263 b) The sources and types of GHG sources or sinks selected by the organization or  
2264 GHG project;
- 2265 c) The GHG quantification methodologies to be used by the organization or GHG  
2266 project;
- 2267 d) Other competencies specific to the GHG scheme (eg, political and legal expertise  
2268 for GHG projects under the Kyoto Protocol);
- 2269 e) Current best practice in the field.  
2270

2271 The validation or verification team composition and competence should also take  
2272 account of the scope of the responsible party's GHG programmes or GHG projects and  
2273 the nature of the GHG reporting system. Key considerations should include:

- 2274 a) Whether the scope is restricted to CO<sub>2</sub> or includes other GHGs;
- 2275 b) The complexity of the GHG information under consideration (ie, is it based solely
- 2276 on fuel/energy use metered by electricity/fuel bills or are emissions largely
- 2277 process-based?);
- 2278 c) The nature of the computer information system used to collect and report GHG
- 2279 information (ie, is it a complex database system requiring working knowledge of
- 2280 information technology systems or is it a simple spreadsheet system?);
- 2281 d) The complexity surrounding the organization or GHG project's operations (ie, is
- 2282 the validation or verification activity to be conducted at a single site or over
- 2283 multiple sites that involve careful consideration of joint venture or outsourcing
- 2284 arrangements?);
- 2285 e) The complexity of the GHG project (ie, is the project a simple energy swap
- 2286 scenario or the complicated, detailed assessment of a new and novel
- 2287 technology?);
- 2288 f) The prevailing legal and regulatory framework within which the organization or
- 2289 GHG project is operating (ie, are the organization or GHG project's activities
- 2290 heavily regulated under national, regional or international law or is the legal and
- 2291 regulatory situation much more simplistic?).
- 2292

2293 **Specific knowledge and skills requirements for validation or verification team**

2294 **leaders and peer reviewers**

2295 Validation or verification bodies should ensure that team leaders and peer reviewers

2296 have the appropriate skills and competencies to fulfil the following key responsibilities:

- 2297 a) Checking that the validation or verification team meets the necessary
- 2298 competency requirements;
- 2299 b) Leading the team and managing the validation or verification process;
- 2300 c) Understanding the agreed scope of the validation or verification and its
- 2301 relationship to a GHG scheme(s) (if appropriate);
- 2302 d) Ensuring that the validation or verification objectives are addressed in the
- 2303 validation or verification planning;
- 2304 e) Resolving issues relating to validation or verification, in particular those
- 2305 associated with materiality issues and shifts in the risk profile of the reported
- 2306 GHG information;
- 2307 f) Directing the drafting of the verification report and statement and communicating
- 2308 or distributing them to the peer reviewer;
- 2309 g) Ensuring all validation or verification documentation, including working papers,
- 2310 supporting evidence, recommendations and the draft report and statement are
- 2311 complete;
- 2312 h) Providing assistance to the peer reviewer in order to complete the validation or
- 2313 verification.
- 2314

2315 **Levels of education, work experience, training and experience for those**

2316 **conducting validations or verifications**

2317 Validation or verification team members should have the following education, work

2318 experience, training and experience:

- 2319 a) Completed an education sufficient to acquire the knowledge and skills described
- 2320 above;

- 2321 b) Have work experience that contributes to the knowledge and skills described  
2322 above. At least some of this work experience should be in a technical,  
2323 managerial or professional position involving the exercise of judgement, problem  
2324 solving, and communication with other managerial or professional personnel,  
2325 peers, clients and other stakeholders;
- 2326 c) Have received formal training and gained practical experience related to the  
2327 activities described in Clause 5 of this International Standard and the associated  
2328 guidance notes in Annex A, preferably under the direction and supervision of a  
2329 validation or verification team leader.
- 2330 d) Validation or verification team leaders and peer reviewers should have acquired  
2331 additional experience to develop the knowledge and skills described above.  
2332

### **Maintenance and improvement of competence**

2333  
2334 Continual professional development is concerned with the maintenance and  
2335 improvement of knowledge, skills and personal attributes. This can be achieved through  
2336 additional work experience, training, private study, coaching, attendance at meetings,  
2337 seminars and conferences or other relevant activities. Validation or verification team  
2338 members should demonstrate their continual professional development.  
2339

2340 The continual professional development activities should take into account changes in  
2341 the needs of the individual and the organization, the practice of GHG information  
2342 validation or verification and principles and requirement of GHG schemes and  
2343 standards.  
2344

2345 Validation or verification team members should maintain and demonstrate their GHG  
2346 information validation or verification abilities through regular participation in GHG  
2347 validations and /or verifications.  
2348

### **Validator or verifier evaluation**

2349  
2350 The evaluation of validation or verification team members and team leaders should be  
2351 planned, implemented and recorded in accordance with the validation or verification  
2352 body's procedures to provide an outcome that is objective, consistent, fair and reliable.  
2353 The evaluation process should identify training and other skill enhancement needs.  
2354

2355 The evaluation of validators and verifiers should occur at the following stages:

- 2356 a) The initial evaluation of persons who wish to become validation or verification  
2357 team members;
- 2358 b) The evaluation of persons as part of the validation or verification team selection  
2359 process described in Clause 5.2.1;
- 2360 c) The continual evaluation of validation or verification team member's performance  
2361 to identify needs for maintenance and improvement of knowledge and skills.  
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**Annex C**  
**(informative)**  
**Useful reference documents**

*To be completed.*

Author	Publication/Document title	Date of publication

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