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Environmental management systems — Requirements with guidance for use

Systèmes de management environnemental — Exigences et lignes directrices pour son utilisation

ICS: 13.020.10

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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Foreword

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

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

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

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#). The committee responsible for this document is Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 1, *Environmental management systems*.

This third edition will cancel and replace the second edition (ISO 14001:2004), which has been technically revised.

NOTE TO THIS TEXT (which will not be included in the published International Standard):

This text has been prepared using the a high level structure, identical core text, and common terms with core definitions, designed to benefit users implementing multiple ISO management system standards, as set out in Annex SL, Appendix 2 of the ISO/IEC Directives, Part 1, Consolidated ISO Supplement, 2014.

The text of Annex SL is shown in the main body of the text (Clauses 1 to 10) by the use of black font. All other text is shown in blue font. This is only to facilitate analysis and will not be incorporated in the final version of ISO 14001.

2 0 Introduction

3 0.1 Background

4 Achieving a balance between environmental, social and economic sub-systems within the global system is
5 considered essential in order to meet the needs of the present without compromising the ability of future
6 generations to meet their needs. This concept of the 'three pillars' of sustainability is the goal of sustainable
7 development.

8 Societal expectations for sustainable development, transparency and accountability have evolved within the
9 context of increasingly stringent legislation, growing pressures on the environment from pollution, and the
10 inefficient use of resources, management of waste, climate change and degradation of eco-systems and
11 biodiversity.

12 This has led organizations to adopt a systematic approach to environmental management by implementing
13 environmental management systems with the aim to contribute to the 'environmental pillar' of sustainability.

14 0.2 Aim of an environmental management system

15 The purpose of this International Standard is to provide organizations with a systematic framework to protect
16 the environment and respond to changing environmental conditions in balance with socio-economic needs. It
17 does so by specifying requirements for an environmental management system that enables an organization to
18 enhance environmental performance by:

- 19 developing and implementing an environmental policy and objectives;
- 20 identifying aspects of its activities, products and services that can result in significant environmental
21 impacts;
- 22 establishing systematic processes which consider its context, and take into account its significant
23 environmental aspects, risk associated with threats and opportunities and its compliance obligations;
- 24 increasing awareness of its relationship with the environment;
- 25 establishing operational controls to manage its significant environmental aspects and compliance
26 obligations;
- 27 evaluating environmental performance and taking actions, as necessary.

28 A systematic approach to environmental management can provide top management with information to build
29 success over the long term and create options for contributing to sustainable development by:

- 30 protecting the environment by preventing or reducing adverse impacts on the environment;
- 31 mitigating the potential adverse impact of environmental conditions on the organization;
- 32 assisting in conforming to compliance obligations;
- 33 enhancing environmental performance;
- 34 controlling or influencing the way the organization's products and services are designed, manufactured,
35 distributed, consumed and disposed by using a life cycle perspective that can prevent environmental
36 burdens from being inadvertently shifted elsewhere within the cycle;
- 37 achieving financial and operational benefits that can result from implementing environmentally sound
38 alternatives that strengthen the organization's market position;

39 communicating environmental information to relevant interested parties.

40 **0.3 Success factors**

41 The success of an environmental management system depends on commitment from all levels and functions
42 of the organization, led by top management. They can leverage opportunities to reduce or eliminate
43 environmental impacts, particularly those with strategic and competitive implications. Top management can
44 effectively address these opportunities by integrating environmental management into its business processes,
45 strategy and decision making, aligning them with other business priorities, and incorporating environmental
46 governance into its overall management system. Demonstration of successful implementation of this
47 International Standard can be used to assure interested parties that an appropriate environmental
48 management system is in place.

49 Adoption of this International Standard, however, will not in itself guarantee optimal environmental outcomes.
50 Two organizations can carry out similar activities but may have different compliance obligations,
51 environmental policy commitments, environmental technologies in use and environmental performance goals,
52 yet both can conform to the requirements of this International Standard.

53 The level of detail and complexity, the extent of documentation and the resources needed for an
54 environmental management system will depend on a number of factors, such as the organization's context, its
55 size and location, its compliance obligations, the scope of the system, and the nature of its activities, products
56 and services, including its environmental aspects and potential impacts.

57 **0.4 Plan, Do, Check and Act approach**

58 The basis for the approach underlying an environmental management system is founded on the Shewhart
59 concept of Plan, Do, Check and Act (PDCA) made popular by Deming. The PDCA model demonstrates an
60 iterative process used by organizations to achieve continual improvement. It can be applied to a management
61 system and to each of its individual elements. It can be briefly described as follows.

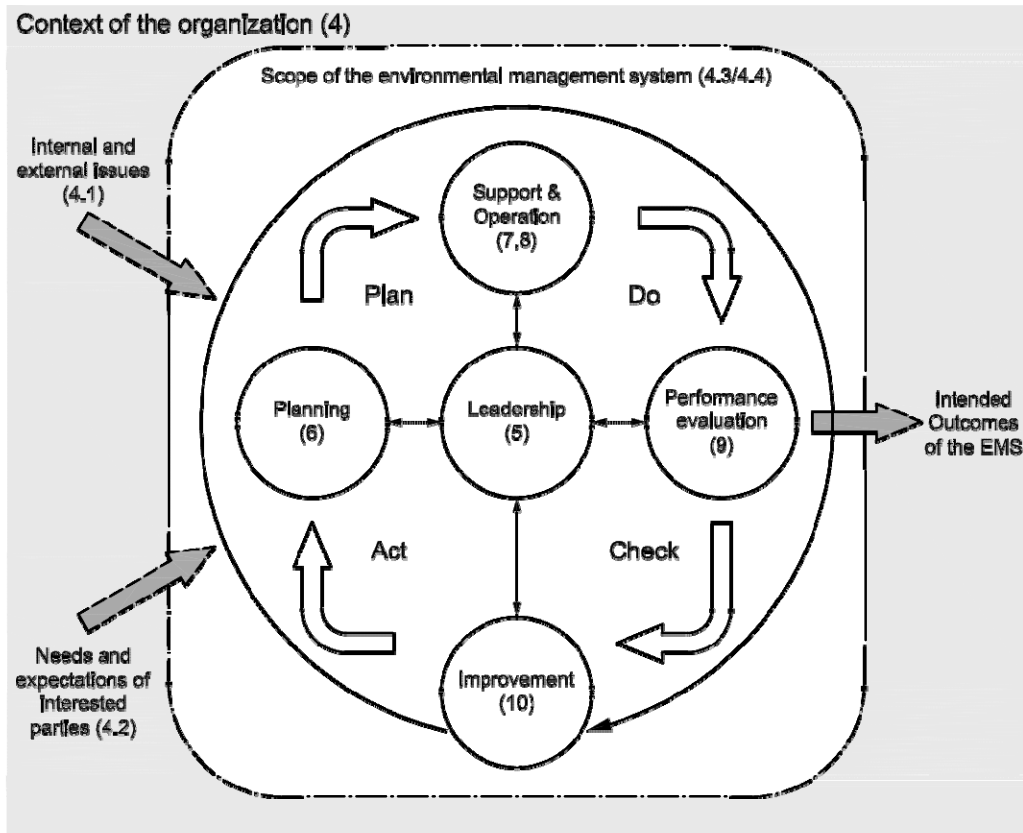
62 Plan: establish objectives and processes necessary to deliver results in accordance with the
63 organization's policy.

64 Do: implement the processes as planned.

65 Check: monitor and measure processes against the policy, including its commitments, objectives and
66 operational controls, and report the results.

67 Act: take actions to continually improve.

68 This International Standard incorporates the PDCA concept into a new framework, as shown in Figure 1.



69

Note: Numbers in brackets refer to the clauses in this International Standard.

70

Figure 1 — Environmental management system model for this International Standard

71 0.5 Contents of this International Standard

72 This International Standard includes revisions to meet environmental challenges facing organizations and
 73 provide value to both new and existing users. It also includes revisions to conform to ISO's requirements for
 74 management system standards¹⁾. These requirements include a high level structure, identical core text, and
 75 common terms with core definitions, designed to benefit users implementing multiple ISO management
 76 system standards.

77 The body of this International Standard, Clauses 1 through 10, contains the requirements used to assess
 78 conformity. Annex A provides informative explanations to prevent misinterpretation of ISO/DIS 14001:2014
 79 requirements. Annex B identifies broad technical correspondence between the previous edition of this
 80 International Standard (ISO 14001:2004) and this edition. Implementation guidance on environmental
 81 management systems is included in ISO 14004²⁾.

1) See the ISO/IEC Directives, Part 1, Consolidated ISO Supplement, Procedures specific to ISO, Fifth edition, 2014, Annex SL, Appendices 2 and 3.

2) Revision of ISO 14004 is ongoing.

82 Environmental management systems — Requirements with 83 guidance for use

84 1 Scope

85 This International Standard specifies the requirements of an environmental management system for
86 organizations seeking to establish, implement, maintain and continually improve a framework with the aim to
87 manage its environmental responsibilities in a manner that contributes to the 'environmental pillar' of
88 sustainability.

89 The intended outcomes of an environmental management system provide value for the environment, the
90 organization and its interested parties. Consistent with the organization's environmental policy, the intended
91 outcomes of an environmental management system include:

- 92 enhancement of environmental performance;
- 93 conforming to compliance obligations;
- 94 fulfilment of environmental objectives.

95 This International Standard is applicable to any organization regardless of size, type and nature and applies to
96 the environmental aspects that the organization determines it can either control or can influence considering a
97 life cycle perspective. It does not state specific environmental performance criteria, nor does it increase or
98 change an organization's legal obligations.

99 This International Standard can be used in whole or in part to improve environmental management, but all the
100 requirements are intended to be incorporated into an environmental management system and fulfilled, without
101 exclusion, if an organization claims it complies with this International Standard.

102 2 Normative references

103 No normative references are cited. This clause is included to maintain clause numbering alignment with other
104 ISO management system standards.

105 3 Terms and definitions

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

107 3.1

108 organization

109 person or group of people that has its own functions with responsibilities, authorities and relationships to
110 achieve its *objectives* (3.16)

111 Note 1 to entry: The concept of organization includes, but is not limited to sole-trader, company, corporation, firm,
112 enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public
113 or private.

114 **3.2**

115 **top management**

116 person or group of people who directs and controls an *organization* (3.1) at the highest level

117 Note 1 to entry: Top management has the power to delegate authority and provide resources within the organization.

118 Note 2 to entry: If the scope of the *management system* (3.3) covers only part of an organization, then top
119 management refers to those who direct and control that part of the organization.

120 **3.3**

121 **management system**

122 set of interrelated or interacting elements of an *organization* (3.1) to establish policies and *objectives* (3.16)
123 and *processes* (3.26) to achieve those objectives

124 Note 1 to entry: A management system can address a single discipline or several disciplines (e.g. *quality*,
125 *environment*, *occupational health and safety*).

126 Note 2 to entry: The system elements include the organization's structure, roles and responsibilities, planning and
127 operation, *performance evaluation and improvement*.

128 Note 3 to entry: The scope of a management system may include the whole of the organization, specific and identified
129 functions of the organization, specific and identified sections of the organization, or one or more functions across a group
130 of organizations.

131 **3.4**

132 **environmental management system**

133 part of the *management system* (3.3) used to manage *environmental aspects* (3.9), conform to *compliance*
134 *obligations* (3.22), and address *risk* (3.18) associated with threats and opportunities

135 **3.5**

136 **interested party**

137 person or *organization* (3.1) that can affect, be affected by, or perceive itself to be affected by a decision or
138 activity

139 Note 1 to entry: Interested parties can include person(s) and groups concerned with or affected by the *environmental*
140 *performance* (3.13) of an organization.

141 Note 2 to entry: To "perceive itself to be affected" means the perception has been made known to the organization.

142 Note 3 to entry: Interested parties can include customers, communities, suppliers, regulators, nongovernment
143 organizations, investors, employees.

144 **3.6**

145 **environmental policy**

146 intentions and direction of an *organization* (3.1) as formally expressed by its *top management* (3.2) related to
147 *environmental performance* (3.13)

148 **3.7**

149 **documented information**

150 information required to be controlled and maintained by an *organization* (3.1) and the medium on which it is
151 contained

152 Note 1 to entry: Documented information can be in any format and media, and from any source.

153 Note 2 to entry: Documented information can refer to:

154 – the *environmental management system* (3.4), including related *processes* (3.26);

155 – information created in order for the organization to operate (may also be referred to as documentation);

156 — evidence of results achieved (may also be referred to as records).

157 **3.8**

158 **environment**

159 surroundings in which an *organization* (3.1) operates including air, water, land, natural resources, flora, fauna,
160 humans and their interrelations

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

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

164 **3.9**

165 **environmental aspect**

166 element of an *organization's* (3.1) activities or products or services that interacts or can interact with the
167 *environment* (3.8)

168 Note 1 to entry: An environmental aspect can cause (an) *environmental impact(s)* (3.10). A significant environmental
169 aspect is one that has or can have a significant environmental impact.

170 Note 2 to entry: Significant environmental aspects are determined by the organization applying one or more criteria.

171 **3.10**

172 **environmental impact**

173 change to the *environment* (3.8), whether adverse or beneficial, wholly or partially resulting from an
174 *organization's* (3.1) *environmental aspects* (3.9)

175 **3.11**

176 **environmental condition**

177 state or characteristic of the *environment* (3.8) as determined at a certain point of time

178 **3.12**

179 **performance**

180 measurable result

181 Note 1 to entry: Performance can relate either to quantitative or qualitative findings.

182 Note 2 to entry: Performance can relate to the management of activities, *processes* (3.26), products (including
183 services), systems or *organizations* (3.1).

184 **3.13**

185 **environmental performance**

186 *performance* (3.12) related to the management of *environmental aspects* (3.9)

187 Note 1 to entry: In the context of *environmental management systems* (3.4), results can be measured against the
188 organization's *environmental policy* (3.6), *environmental objectives* (3.17) or other criterion, using indicators.

189 **3.14**

190 **prevention of pollution**

191 use of *processes* (3.26), practices, techniques, materials, products, services or energy to avoid, reduce or
192 control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in
193 order to reduce adverse *environmental impacts* (3.10)

194 Note 1 to entry: Prevention of pollution can include source reduction or elimination, process, product or service
195 changes, efficient use of resources, material and energy substitution, reuse, recovery, recycling, reclamation and
196 treatment.

- 197 **3.15**
198 **life cycle**
199 consecutive and interlinked stages of a product system, from raw material acquisition or generation from
200 natural resources to end-of-life treatment
- 201 Note 1 to entry: Life cycle includes activities, products, and services and may include procured goods and services, as
202 well as end-of-life treatment of products and delivery of services, for example, design, manufacture, transport, packaging
203 and end-use or disposal.
- 204 [Source: ISO 14044:2006, 3.1, modified — refer to 'end-of-life treatment', not 'final disposal', Note 1 to entry
205 was added].
- 206 **3.16**
207 **objective**
208 result to be achieved
- 209 Note 1 to entry: An objective can be strategic, tactical, or operational.
- 210 Note 2 to entry: Objectives can relate to different disciplines (such as financial, health and safety, and environmental
211 goals) and can apply at different levels (such as strategic, organization-wide, project, product, service and *process* (3.26)).
- 212 Note 3 to entry: An objective can be expressed in other ways, e.g. as an intended outcome, a purpose, an operational
213 criterion, as an *environmental objective* (3.17), or by the use of other words with similar meaning (e.g. aim, goal, or target).
- 214 **3.17**
215 **environmental objective**
216 *objective* (3.16) set by the *organization* (3.1) consistent with the *environmental policy* (3.6)
- 217 **3.18**
218 **risk**
219 effect of uncertainty on *objectives* (3.16)
- 220 Note 1 to entry: An effect is a deviation from the expected — positive or negative.
- 221 Note 2 to entry: Uncertainty is the state, even partial, of deficiency of information related to, understanding or
222 knowledge of, an event, its consequence, or likelihood.
- 223 Note 3 to entry: Risk is often characterized by reference to potential “*events*” (as defined in ISO Guide 73:2009,
224 3.5.1.3) and “*consequences*” (as defined in ISO Guide 73:2009, 3.6.1.3), or a combination of these.
- 225 Note 4 to entry: Risk is often expressed in terms of a combination of the consequences of an event (including changes
226 in circumstances) and the associated “*likelihood*” (as defined in ISO Guide 73:2009, 3.6.1.1) of occurrence.
- 227 **3.19**
228 **competence**
229 ability to apply knowledge and skills to achieve intended results
- 230 **3.20**
231 **effectiveness**
232 extent to which planned activities are realized and planned results achieved
- 233 **3.21**
234 **requirement**
235 need or expectation that is stated, generally implied or obligatory
- 236 Note 1 to entry: “Generally implied” means that it is custom or common practice for the *organization* (3.1) and
237 *interested parties* (3.5) that the need or expectation under consideration is implied.
- 238 Note 2 to entry: A specified requirement is one that is stated, for example in *documented information* (3.7).

239 Note 3 to entry: Requirements other than legal requirements become obligatory when the organization decides to
240 comply with them.

241 3.22

242 compliance obligation

243 *requirement* (3.21) that an *organization* (3.1) has to or chooses to comply with

244 Note 1 to entry: Obligations may arise from mandatory *requirements* (3.21), such as applicable laws and regulations,
245 or voluntary commitments, such as organizational and industry standards, contractual relationships, principles of good
246 governance and community and ethical standards.

247 [Source: ISO/DIS 19600:2014, 3.31]

248 3.23

249 conformity

250 fulfilment of a *requirement* (3.21)

251 3.24

252 nonconformity

253 non-fulfilment of a *requirement* (3.21)

254 Note 1 to entry: Nonconformity relates to *compliance obligations* (3.22), including requirements in this International
255 Standard and additional *environmental management system* (3.4) requirements that an *organization* (3.1) establishes for
256 itself.

257 3.25

258 corrective action

259 action to eliminate the cause of a *nonconformity* (3.24) and to prevent recurrence

260 3.26

261 process

262 set of interrelated or interacting activities which transforms inputs into outputs

263 Note 1 to entry: Processes can be documented or not.

264 3.27

265 measurement

266 *process* (3.26) to determine a value

267 3.28

268 audit

269 systematic, independent and documented *process* (3.26) for obtaining audit evidence and evaluating it
270 objectively to determine the extent to which the audit criteria are fulfilled

271 Note 1 to entry: An internal audit is conducted by the *organization* (3.1) itself or by an external party on its behalf.

272 Note 2 to entry: An audit can be a combined audit (combining two or more disciplines).

273 Note 3 to entry: Independence can be demonstrated by the freedom from responsibility for the activity being audited or
274 freedom from bias and conflict of interest.

275 Note 4 to entry: "Audit evidence" consists of verifiable records, statements of fact and other information relevant to the
276 audit criteria, and "audit criteria" are the set of policies, *procedures* (3.30) or *requirements* (3.21) used as a reference
277 against which audit evidence is compared, as defined in ISO 19011.

278 3.29

279 continual improvement

280 recurring activity to enhance *performance* (3.12)

281 Note 1 to entry: Enhancing performance relates to the use of the *environmental management system* (3.4) in order to
282 enhance *environmental performance* (3.13) consistent with the *organization's* (3.1) *environmental policy* (3.6).

283 Note 2 to entry: The activity need not take place in all areas simultaneously, or without interruption.

284 **3.30**
285 **procedure**
286 specified way to carry out an activity or a *process* (3.26)

287 Note 1 to entry: Procedures can be documented or not.

288 **3.31**
289 **monitoring**
290 determining the status of a system, a *process* (3.26) or an activity

291 Note 1 to entry: To determine the status, there may be a need to check, supervise or critically observe.

292 **3.32**
293 **outsource** (verb)
294 make an arrangement where an external *organization* (3.1) performs part of an organization's function or
295 *process* (3.26)

296 Note 1 to entry: An external organization is outside the scope of the *management system* (3.3), although the
297 outsourced function or process is within the scope.

298 **3.33**
299 **indicator**
300 measurable representation of the condition or status of operations, management or conditions

301 [SOURCE: ISO 14031:2013, 3.15]

302 **4 Context of the organization**

303 **4.1 Understanding the organization and its context**

304 The organization shall determine external and internal issues that are relevant to its purpose and that affect its
305 ability to achieve the intended outcome(s) of its environmental management system. *Those issues include*
306 *environmental conditions capable of affecting or being affected by the organization.*

307 **4.2 Understanding the needs and expectations of interested parties**

308 The organization shall determine:

- 309 — the interested parties that are relevant to the environmental management system;
- 310 — the relevant *needs and expectations* (i.e. requirements) of these interested parties;
- 311 — *which of these needs and expectations become compliance obligations.*

312 **4.3 Determining the scope of the environmental management system**

313 The organization shall determine the boundaries and applicability of the environmental management system
314 to establish its scope.

315 When determining this scope, the organization shall consider:

- 316 — the external and internal issues referred to in 4.1;

- 317 — the **compliance obligations** referred to in 4.2;
 - 318 — **its organizational unit(s), function(s), and physical boundaries**;
 - 319 — **its activities, products and services**;
 - 320 — **its authority and ability to exercise control and influence**.
- 321 **Once the scope is defined, activities, products and services that can have significant environmental aspects**
 322 **(see 6.1.2) shall be included within the scope of the environmental management system.**
- 323 The scope shall be **maintained** as documented information **and be available to interested parties**.

324 **4.4 Environmental management system**

325 The organization shall establish, implement, maintain and continually improve an environmental management
 326 system, including the processes needed and their interactions, in accordance with the requirements of this
 327 International Standard, **to enhance its environmental performance**.

328 **The organization shall consider the knowledge of its context when establishing and maintaining the**
 329 **environmental management system.**

330 **5 Leadership**

331 **5.1 Leadership and commitment**

332 Top management shall demonstrate leadership and commitment with respect to the environmental
 333 management system by:

- 334 — **taking accountability for the effectiveness of the environmental management system**;
- 335 — ensuring that the environmental policy and environmental objectives are established and are compatible
 336 with the strategic direction **and the context** of the organization;
- 337 — ensuring the integration of the environmental management system requirements into the organization's
 338 business processes;
- 339 — ensuring that the resources needed for the environmental management system are available;
- 340 — communicating the importance of effective environmental management and of conforming to the
 341 environmental management system requirements;
- 342 — ensuring that the environmental management system achieves its intended outcome(s);
- 343 — directing and supporting persons to contribute to the effectiveness of the environmental management
 344 system;
- 345 — promoting continual improvement;
- 346 — supporting other relevant management roles to demonstrate their leadership as it applies to their areas of
 347 responsibility.

348 **NOTE** Reference to "business" in this International Standard can be interpreted broadly to mean those activities that
 349 are core to the purposes of the organization's existence.

350 **5.2 Environmental policy**

351 Top management shall establish, **implement and maintain** an environmental policy that, **within the defined**
352 **scope of its environmental management system**:

353 a) is appropriate to

354 1) the purpose of the organization;

355 2) **the organization's context, including the nature, scale and environmental impacts of its activities,**
356 **products and services**;

357 b) provides a framework for setting environmental objectives;

358 c) **includes (a) commitment(s) to the protection of the environment, including prevention of pollution and**
359 **others specific to the context of the organization**;

360 **NOTE** Other specific commitment(s) to protect the environment can include sustainable resource use, climate change
361 **mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues (see 4.1).**

362 d) includes a commitment to **conform to compliance obligations**;

363 e) includes a commitment to continual improvement of the environmental management system **to enhance**
364 **environmental performance**.

365 The environmental policy shall:

366 — be **maintained** as documented information;

367 — be communicated within the organization, **including persons doing work under the organization's control**;

368 — be available to interested parties.

369 **5.3 Organizational roles, responsibilities and authorities**

370 Top management shall ensure that the responsibilities and authorities for relevant roles are assigned and
371 communicated within the organization **to facilitate effective environmental management**.

372 Top management shall assign the responsibility and authority for:

373 a) ensuring that the environmental management system conforms to the requirements of this International
374 Standard;

375 b) reporting on the performance of the environmental management system, **including environmental**
376 **performance**, to top management.

377 **6 Planning**

378 **6.1 Actions to address risk associated with threats and opportunities**

379 **6.1.1 General**

380 **The organization shall plan and implement a process to meet the requirements in 6.1.**

381 When planning for the environmental management system **in 6.1 (i.e. 6.1.2 - 6.1.4)**, the organization shall
382 consider the issues referred to in 4.1 and the requirements referred to in 4.2.

383 The organization shall maintain documented information to the extent necessary to have confidence that the
384 process has been carried out as planned.

385 **6.1.2 Significant environmental aspects**

386 Within the defined scope of the environmental management system, the organization shall:

387 a) identify the environmental aspects and associated environmental impacts of its activities, products and
388 services that it can control and those that it can influence, considering a life cycle perspective;

389 b) take into account:

390 1) change, including planned or new developments and new or modified activities, products and
391 services;

392 2) identified abnormal and potential emergency situations.

393 The organization shall determine those aspects that have or can have a significant impact on the environment,
394 i.e. significant environmental aspects.

395 The organization shall communicate its significant environmental aspects among the various levels and
396 functions of the organization.

397 The organization shall maintain documented information of its:

398 — criteria used to determine its significant environmental aspects;

399 — environmental aspects and associated environmental impacts;

400 — significant environmental aspects.

401 NOTE Significant environmental aspects can result in risk associated with either adverse environmental impacts
402 (threats) or beneficial environmental impacts (opportunities).

403 **6.1.3 Compliance obligations**

404 The organization shall:

405 a) identify and have access to the compliance obligations related to its environmental aspects;

406 b) determine how these compliance obligations apply to the organization.

407 The organization shall maintain documented information of its compliance obligations.

408 NOTE Compliance obligations can have the potential to result in risk associated with either adverse impacts (threats)
409 or beneficial impacts (opportunities) to the organization.

410 **6.1.4 Risk associated with threats and opportunities**

411 The organization shall determine the risk associated with threats and opportunities that needs to be
412 addressed to:

413 — give assurance that the environmental management system can achieve its intended outcome(s);

414 — prevent, or reduce, undesired effects, including the potential for external environmental conditions to
415 affect the organization;

416 — achieve continual improvement.

417 The organization shall maintain documented information of the risk associated with threats and opportunities
418 that needs to be addressed.

419 **6.1.5 Planning to take action**

420 The organization shall plan:

421 a) to take actions to address risk associated with threats and opportunities (see 6.1.4), significant
422 environmental aspects (see 6.1.2) and compliance obligations (see 6.1.3);

423 b) how to:

424 — integrate and implement the actions into its environmental management system processes;

425 — evaluate the effectiveness of these actions.

426 **6.2 Environmental objectives and planning to achieve them**

427 **6.2.1 Environmental objectives**

428 The organization shall establish environmental objectives at relevant functions and levels:

429 — taking into account the organization's significant environmental aspects and its compliance obligations;

430 — considering the risk associated with threats and opportunities.

431 When developing these objectives, the organization shall consider its technological options and financial,
432 operational and business requirements.

433 The environmental objectives shall:

434 be consistent with the environmental policy;

435 a) be measurable (if practicable);

436 b) be monitored;

437 c) be communicated;

438 d) be updated as appropriate.

439 The organization shall retain documented information on the environmental objectives.

440 **6.2.2 Planning actions to achieve environmental objectives**

441 When planning how to achieve its environmental objectives, the organization shall determine:

442 — what will be done;

443 — what resources will be required;

444 — who will be responsible;

445 — when it will be completed;

446 — how the results will be evaluated, including indicators for monitoring progress toward achievement of
447 measurable environmental objectives (see 9.1.1).

448 The organization shall consider how the actions to achieve environmental objectives can be integrated into the
449 organization's business processes.

450 **7 Support**

451 **7.1 Resources**

452 The organization shall determine and provide the resources needed for the establishment, implementation,
453 maintenance and continual improvement of the environmental management system.

454 **7.2 Competence**

455 The organization shall:

456 — determine the necessary competence of person(s) doing work under its control that affects its
457 environmental performance;

458 — ensure that these persons are competent on the basis of appropriate education, training, or experience;

459 — where applicable, take actions to acquire the necessary competence, and evaluate the effectiveness of
460 the actions taken.

461 NOTE Applicable actions can include, for example, the provision of training to, the mentoring of, or the re-assignment
462 of currently employed persons; or the hiring or contracting of competent persons.

463 The organization shall retain appropriate documented information as evidence of competence.

464 **7.3 Awareness**

465 Persons doing work under the organization's control shall be aware of:

466 — the environmental policy;

467 — the significant environmental aspects and related actual or potential impacts associated with their work;

468 — their contribution to the effectiveness of the environmental management system, including the benefits of
469 enhanced environmental performance;

470 — the implications of not conforming with the environmental management system requirements including
471 compliance obligations.

472 **7.4 Communication**

473 **7.4.1 General**

474 The organization shall plan and implement a process for internal and external communications relevant to the
475 environmental management system, including:

476 — on what it will communicate;

477 — when to communicate;

478 — with whom to communicate;

479 — how to communicate.

480 When planning its communications process, the organization shall:

481 — take into account its compliance obligations;

482 — ensure that environmental information communicated is consistent with information generated within the
483 environmental management system, and is reliable.

484 The organization shall respond to relevant communications on its environmental management system.

485 The organization shall retain documented information as evidence of its communications, as appropriate.

486 **7.4.2 Internal communication**

487 With regard to its environmental management system, the organization shall:

488 a) communicate among the various levels and functions of the organization, including changes to the
489 environmental management system, as appropriate;

490 b) ensure its communication process enables any person doing work under the organization's control to
491 contribute to continual improvement.

492 **7.4.3 External communication**

493 The organization shall externally communicate information relevant to the environmental management
494 system, as determined by its communication process and as required by its compliance obligations.

495 **7.5 Documented information**

496 **7.5.1 General**

497 The organization's environmental management system shall include:

498 a) documented information required by this International Standard;

499 b) documented information determined by the organization as being necessary for the effectiveness of the
500 environmental management system.

501 NOTE The extent of documented information for an environmental management system can differ from one
502 organization to another due to:

503 — the size of organization and its type of activities, processes, products and services;

504 — the complexity of processes and their interactions;

505 — the competence of persons.

506 **7.5.2 Creating and updating**

507 When creating and updating documented information the organization shall ensure appropriate:

508 — identification and description (e.g. a title, date, author, or reference number);

509 — format (e.g. language, software version, graphics) and media (e.g. paper, electronic);

510 — review and approval for suitability and adequacy.

511 **7.5.3 Control of documented information**

512 Documented information required by the environmental management system and by this International
513 Standard shall be controlled to ensure:

514 a) it is available and suitable for use, where and when it is needed;

515 b) it is adequately protected (e.g. from loss of confidentiality, improper use, or loss of integrity).

516 For the control of documented information, the organization shall address the following activities, as
517 applicable:

518 — distribution, access, retrieval and use;

519 — storage and preservation, including preservation of legibility;

520 — control of changes (e.g. version control);

521 — retention and disposition.

522 Documented information of external origin determined by the organization to be necessary for the planning
523 and operation of the environmental management system shall be identified, as appropriate, and controlled.

524 NOTE Access can imply a decision regarding the permission to [review](#) the documented information only, or the
525 permission and authority to view and change the documented information.

526 **8 Operation**527 **8.1 Operational planning and control**

528 The organization shall plan, implement and control the processes needed to meet [environmental management](#)
529 [system](#) requirements, and to implement the actions determined in 6.1 [and](#) 6.2, by:

530 — establishing criteria for the processes;

531 — implementing control of the processes, in accordance with the criteria [and to prevent deviation from the](#)
532 [environmental policy, environmental objectives and compliance obligations](#).

533 NOTE Controls can include [engineering controls, procedures, documented procedure, etc.](#) They can be implemented
534 [following a hierarchy \(e.g. elimination, substitution, administrative\) and can be used singly or in combination.](#)

535 The organization shall control planned changes and review the consequences of unintended changes, taking
536 action to mitigate any adverse effects, as necessary.

537 The organization shall ensure that outsourced processes are controlled [or influenced](#). [The type and degree of](#)
538 [control or influence to be applied to these processes shall be defined within the environmental management](#)
539 [system](#).

540 [Consistent with a life cycle perspective, the organization shall:](#)

541 a) [determine environmental requirements for the procurement of products and services, as appropriate;](#)

542 b) [establish controls to ensure that environmental requirements are considered in the design process for the](#)
543 [development, delivery, use and end-of-life treatment of its products and services, as appropriate;](#)

544 c) [communicate relevant environmental requirement\(s\) to external providers, including contractors;](#)

545 d) consider the need to provide information about potential significant environmental impacts during the
546 delivery of the products or services and during use and end-of-life treatment of the product.

547 The organization shall maintain documented information to the extent necessary to have confidence that the
548 processes have been carried out as planned.

549 **8.2 Emergency preparedness and response**

550 The organization shall establish and implement a procedure specifying how it will respond to potential
551 environmental emergency situations and potential accidents.

552 The organization shall:

553 a) respond to actual emergency situations and accidents;

554 b) take action to reduce the consequences of environmental emergency situations, appropriate to the
555 magnitude of the emergency or accident and the potential environmental impact;

556 c) take action to prevent the occurrence of environmental emergency situations and accidents;

557 d) periodically test the procedure where practicable;

558 e) periodically review and, where necessary, revise the procedure, in particular, after the occurrence of
559 accidents, emergency situations or tests.

560 **9 Performance evaluation**

561 **9.1 Monitoring, measurement, analysis and evaluation**

562 **9.1.1 General**

563 The organization shall determine:

564 — what needs to be monitored and measured, related to:

565 1) its operations that can have a significant environmental impact;

566 2) its compliance obligations;

567 3) operational controls;

568 4) progress towards the organization's environmental objectives, using indicators;

569 — the methods for monitoring, measurement, analysis and evaluation, as applicable, to ensure valid results;

570 — the criteria against which the organization will evaluate its environmental performance, using appropriate
571 indicators;

572 — when the monitoring and measuring shall be performed;

573 — when the results from monitoring and measurement shall be analysed and evaluated.

574 The organization shall ensure that calibrated or verified monitoring and measurement equipment is used and
575 maintained as appropriate.

576 The organization shall evaluate its environmental performance and provide input to the management review
577 (see 9.3) for the evaluation of the effectiveness of the environmental management system.

578 The organization shall retain appropriate documented information as evidence of the monitoring,
579 measurement, analysis and evaluation results.

580 The organization shall communicate information relevant to its environmental performance both internally and
581 externally, as determined by its communication process and as required by its compliance obligations.

582 9.1.2 Evaluation of compliance

583 The organization shall plan and implement a process to evaluate conformity with its compliance obligations.

584 The organization shall:

585 — determine the frequency that compliance will be evaluated;

586 — evaluate compliance and take action if needed;

587 — maintain knowledge and understanding of its status of conforming with compliance obligations.

588 The organization shall retain documented information as evidence of the compliance evaluation result(s).

589 9.2 Internal audit

590 9.2.1 The organization shall conduct internal audits at planned intervals to provide information on whether
591 the environmental management system:

592 a) conforms to:

593 — the organization's own requirements for its environmental management system;

594 — the requirements of this International Standard;

595 b) is effectively implemented and maintained.

596 9.2.2 The organization shall:

597 a) plan, establish, implement and maintain an audit programme(s), including the frequency, methods,
598 responsibilities, planning requirements and reporting, which shall take into consideration the
599 environmental importance of the processes concerned, risk associated with threats and opportunities and
600 the results of previous audits;

601 b) define the audit criteria and scope for each audit;

602 c) select auditors and conduct audits to ensure objectivity and the impartiality of the audit process;

603 d) ensure that the results of the audits are reported to relevant management.

604 The organization shall retain documented information as evidence of the implementation of the audit
605 programme and the audit results.

606 9.3 Management review

607 Top management shall review the organization's environmental management system, at planned intervals, to
608 ensure its continuing suitability, adequacy and effectiveness.

609 The management review shall include consideration of:

610 a) the status of actions from previous management reviews;

- 611 b) changes in:
- 612 — external and internal issues that are relevant to the environmental management system;
 - 613 — compliance obligations;
 - 614 — its significant environmental aspects and risk associated with threats and opportunities;
- 615 c) the extent to which objectives have been met;
- 616 d) information on the organization's environmental performance, including trends in:
- 617 — nonconformities and corrective actions;
 - 618 — monitoring and measurement results;
 - 619 — conformity to its compliance obligations;
 - 620 — audit results;
- 621 e) communication(s) from external interested parties;
- 622 f) opportunities for continual improvement;
- 623 g) the adequacy of resources required for maintaining an effective environmental management system.
- 624 The outputs of the management review shall include:
- 625 — conclusions on the continuing suitability, adequacy and effectiveness of the environmental management
626 system;
 - 627 — decisions related to continual improvement opportunities;
 - 628 — any need for changes to the environmental management system, including resource needs;
 - 629 — actions if needed, when objectives have not been met;
 - 630 — any implications for the strategic direction of the organization.
- 631 The organization shall retain documented information as evidence of the results of management reviews.

632 **10 Improvement**

633 **10.1 Nonconformity and corrective action**

634 When a nonconformity occurs, the organization shall:

- 635 a) react to the nonconformity and, as applicable:
- 636 — take immediate action to control and correct it;
 - 637 — mitigate adverse environmental impacts;
 - 638 — deal with the consequences;

- 639 b) evaluate the need for action to eliminate the causes of the nonconformity, in order that it does not recur or
640 occur elsewhere, by:
- 641 — reviewing the nonconformity;
 - 642 — determining the causes of the nonconformity;
 - 643 — determining if similar nonconformities exist, or could potentially occur;
- 644 c) **determine and** implement any **corrective** action needed;
- 645 d) review the effectiveness of any corrective action taken;
- 646 e) make changes to the environmental management system, if necessary.
- 647 Corrective actions shall be appropriate to **the significance of** the effects of the nonconformities encountered,
648 **including the environmental impact(s)**.
- 649 The organization shall retain documented information as evidence of:
- 650 — the nature of the nonconformities and any subsequent actions taken;
 - 651 — the results of any corrective action.
- 652 **10.2 Continual improvement**
- 653 The organization shall continually improve the suitability, adequacy and effectiveness of the environmental
654 management system **to enhance environmental performance**.

655 **Annex A**
656 (informative)

657 **Guidance on the use of this International Standard**
658

659

660 **A.1 General**

661 This International Standard outlines the requirements of a robust, credible and reliable environmental
662 management system. The additional text given in this Annex is strictly informative and is intended to prevent
663 misinterpretation of the requirements contained in this International Standard. While this information
664 addresses and is consistent with these requirements, it is not intended to add to, subtract from, or in any way
665 modify them.

666 The user should not read a particular sentence or clause of this International Standard in isolation from other
667 clauses of the standard. There is an interrelationship between the requirements in some clauses with the
668 requirements in other clauses.

669 **A.2 Scope**

670 This International Standard does not contain explanatory information on Clause 1.

671 **A.3 Normative references**

672 This International Standard does not contain explanatory information on Clause 2.

673 **A.4 Terms and definitions**

674 The terms that are defined in Clause 3 have a specialized technical meaning and are normative for use in this
675 International Standard. This sub-clause provides further explanation of some of the words that are commonly
676 used in management system standards, to help the user understand their implications and to help in
677 translations.

678 — 'Programme': planned series of steps, projects or activities to be carried out.

679 — 'Design': working out the form, fit or function of something.

680 — 'Purpose': anticipated (intended or expected) outcome that guides planned actions.

681 — 'Determine': establish or find out.

682 — 'Define': state or describe exactly the nature, scope or meaning of that which is under consideration.

683 — 'Identify': establish the identity of something.

684 To avoid misunderstanding, clarifications of selected concepts are provided below.

685 — '*NOTES*' included in the various clauses of this International Standard are informative.

686 — '*Continual*' indicates duration that occurs over a period of time, but with intervals of interruption (unlike
687 '*continuous*' which indicates duration without interruption). '*Continual*' is therefore the appropriate word to
688 use in the context of improvement.

- 689 — The word '*consider*' means it is necessary to think about but can be rejected; and '*take into account*'
690 means it is necessary to think about but cannot be rejected.
- 691 — The words '*appropriate*' and '*applicable*' are not interchangeable. '*Appropriate*' means suitable (for, to)
692 and implies some degree of freedom, while '*applicable*' means relevant or possible to apply and implies
693 that if it can be done, it should be done.
- 694 — This International Standard uses the term '*interested party*', the term '*stakeholder*' is a synonym as it
695 represents the same concept.
- 696 — The word '*ensure*' means the responsibility can be delegated, but not the accountability to make sure that
697 it is performed.
- 698 This International Standard uses some new terminology. A brief explanation is given below to aid both new
699 users and those who have used prior editions of this International Standard.
- 700 — '*Documented information*' replaces the nouns '*documentation*' and '*record*' used in prior editions of this
701 International Standard. To distinguish the intent of the generic term '*documented information*', this
702 International Standard now uses the phrase '*retain documented information as evidence of...*' to mean
703 records, and '*maintain documented information*' to mean documentation other than records. The phrase
704 "*as evidence of...*" is not a requirement to meet legal evidentiary requirements; its intent is only to
705 indicate objective evidence needs to be retained.
- 706 — The change from '*identify*' to '*determine*' is intended to harmonize with the standardized management
707 system terminology, not to change the intent of the previous edition of this International Standard. The
708 term '*determine*' implies a discovery process that results in knowledge.
- 709 — The term '*intended outcome*' means what the organization intends to achieve by implementing its
710 environmental management system, which includes enhancement of environmental performance,
711 conformance to compliance obligations and fulfilment of environmental objectives. These are the minimal,
712 core outcomes, and organizations can set additional intended outcomes for their environmental
713 management system.
- 714 — The phrase '*compliance obligations*' replaces the phrase '*legal requirements and other requirements to*
715 *which the organization subscribes*' used in prior editions of this International Standard. The change is
716 considered simpler to understand, and does not change the intent of the previous edition of this
717 International Standard.
- 718 — The use of the word '*any*' implies selection and choice.

719 **A.5 Context of the organization**

720 **A.5.1 Understanding the context of the organization**

721 The intent of 4.1 is to provide a high-level, conceptual understanding of the important issues that can affect,
722 either positively or negatively, the way the organization manages its environmental responsibilities. Issues are
723 important topics for the organization, problems for debate and discussion or changing circumstances that
724 affect the organization's ability to achieve the intended outcomes it sets for its environmental management
725 system.

726 Internal and external Issues relevant to the organization's context may include, but are not limited to:

- 727 a) environmental conditions related to climate, air quality, water quality, land use, existing contamination,
728 natural resource availability, biodiversity, etc., that can either affect the organization's purpose, or be
729 affected by its environmental aspects;

730 b) the external cultural, social, political, legal, regulatory, financial, technological, economic, natural and
731 competitive context, whether international, national, regional or local;

732 c) the internal characteristics or conditions of the organization, such as its activities, products and services,
733 strategic direction, culture and capabilities (people, knowledge, processes, systems).

734 An understanding of an organization's context results in knowledge that is used to guide its efforts to
735 establish, implement, maintain and continually improve its environmental management system (see 4.4). The
736 internal and external issues that give rise to risk associated with threats and opportunities to the organization
737 or to the environmental management system (see 6.1.4) need to be addressed (see 6.1.5) and managed (see
738 6.2, 8.1, 8.2 and 9.1).

739 This organization may document its knowledge of the organization's context, as appropriate.

740 **A.5.2 Understanding the needs and expectations of interested parties**

741 An organization is expected to gain a general (i.e., high-level, not detailed) understanding of the expressed
742 needs and expectations of those internal and external interested parties that have been determined to be
743 relevant so that the knowledge gained can be considered when determining its compliance obligations.

744 The organization is expected to consider known needs and expectations of interested parties in order to
745 determine those that are relevant. In the case of an interested party perceiving itself to be affected by the
746 organization's decisions or activities related to environmental performance, the organization considers the
747 relevant needs and expectations that have been in some way expressed or disclosed by the party to the
748 organization.

749 Interested party requirements are not necessarily requirements of the organization. Some interested party
750 requirements reflect needs and expectations that are mandatory because they have been incorporated into
751 laws, regulations, permits and licenses by governmental or even court decision. Others the organization may
752 decide to voluntarily agree to or adopt, (e.g. entering into a contractual relationship, or subscribing to a
753 voluntary initiative). Once the organization adopts them, then they become organizational requirements, i.e.
754 compliance obligations, and are taken into account when planning for the environmental management system
755 (see 4.4). A more detailed-level analysis of its compliance obligations is performed in 6.1.3.

756 The organization may document its knowledge of relevant interested party requirements, as appropriate.

757 **A.5.3 Scope of the environmental management system**

758 The scope of the environmental management system is intended to clarify the spatial and organizational
759 boundaries to which the environmental management system will apply, especially if the organization is a part
760 of a larger organization at a given location. An organization has the freedom and flexibility to define its
761 boundaries. It may choose to implement this International Standard with respect to the entire organization, or
762 to (a) specific part(s) of the organization, as long as the top management of that part of the organization has
763 authority for establishing an environmental management system.

764 In setting the scope, the credibility of the environmental management system will depend upon the choice of
765 organizational boundaries. The organization considers the degree of control or influence that it can exert over
766 activities, products and services considering a life cycle perspective. Scoping should not be used to exclude
767 activities, products, services, or facilities that have or can have significant environmental aspects, or to evade
768 its compliance obligations. The scope should be factual and representative of the organization's operations
769 included within its environmental management system boundaries so that it does not mislead interested
770 parties.

771 Once the organization asserts it conforms to this International Standard, the scope is made available to
772 interested parties.

773 **A.5.4 Environmental management system**

774 The organization retains authority, accountability, and autonomy, to decide how it will fulfil the requirements of
775 this International Standard, including the level of detail and extent to which it will:

- 776 — integrate environmental management system requirements into its various business functions, such as
777 design & development, procurement, human resources, sales and marketing, etc.;
- 778 — incorporate issues associated with its context (see 4.1) and interested party requirements (see 4.2) within
779 its environmental management system.

780 If this International Standard is implemented for (a) specific part(s) of an organization, policies and procedures
781 developed by other parts of the organization can be used to meet the requirements of this International
782 Standard, provided that they are applicable to the specific part(s) that will be subject to them.

783 **A.6 Leadership**

784 **A.6.1 Leadership and commitment**

785 Commitment and active support, including providing adequate resources, from the organization's top
786 management are critical for the success of the environmental management system.

787 5.1 specifies actions in which top management is personally involved with and directs in the organization. Top
788 management may not perform all of these actions themselves (e.g. they may delegate responsibility to
789 others), but they are accountable for ensuring that they are performed.

790 Top management is expected to create a culture and environment that encourages people in leadership roles
791 (not necessarily formal management positions, e.g. team leaders) to work actively towards implementing the
792 requirements of the environmental management system and fulfilling the environmental objectives.

793 **A.5.2 Environmental policy**

794 The environmental policy is a set of principles stated as commitments in which top management outlines the
795 long-term direction of the organization to support and enhance its environmental performance. The
796 environmental policy enables the organization to set its objectives and take actions to achieve the intended
797 outcomes of the environmental management system.

798 5.2 specifies three basic commitments for the environmental policy: to protect the environment, to conform to
799 the organization's compliance obligations and to continual improvement. These commitments are then
800 addressed in specific requirements in other clauses to establish, implement, maintain and continually improve
801 a robust, credible and reliable environmental management system.

802 The commitment to protect the environment is intended to not only prevent adverse environmental impacts,
803 but to protect the natural environment from harm and degradation. The specific commitment(s) an
804 organization pursues should be relevant to its context and positively affect the local or regional environmental
805 conditions. These commitments may address water quality, recycling, or air quality and may also include far
806 broader opportunities related to climate change mitigation and adaptation, preservation of biodiversity and
807 ecosystems, and restoration.

808 It is important to understand that the requirements in this International Standard need to be viewed from a
809 systems or holistic perspective. This means that the organization needs to have an appreciation for the
810 relationship between the policy commitments and the requirements that are specified in other clauses.

811 While all the commitments are important, some interested parties are especially concerned with the
812 organization's commitment to conform to its compliance obligations, particularly the need for the organization
813 to meet applicable legal requirements. In this respect it is important to acknowledge that this International
814 Standard specifies a number of interconnected requirements related to this commitment. This includes the

815 need to determine compliance obligations, to ensure operations are carried out in accordance with these
816 compliance obligations and to evaluate conformity with the compliance obligations.

817 The organization's reputation and the credibility of its environmental management system are dependent on
818 its success in meeting and when possible, exceeding all of its policy commitments.

819 **A.5.3 Organizational roles, responsibilities and authorities**

820 Person(s) assigned these roles by top management should have sufficient access to top management in order
821 to ensure the participation of top management in case of critical situations related to the establishment,
822 implementation, maintenance and continual improvement of the environmental management system. The role
823 of and authority for reporting on the performance of the environmental management system is often assigned
824 to (a) management representative(s).

825 **A.6 Planning**

826 **A.6.1 Actions to address risk associated with threats and opportunities**

827 **A.6.1.1 General**

828 The context of the organization (see 4.1 and 4.2) provides an overarching framework for evaluating the risk
829 associated with threats and opportunities in 6.1. It provides a basis for:

- 830 a) identifying environmental aspects and for establishing criteria for determining those that may be
831 significant;
- 832 b) determining compliance obligations and understanding how they apply to the organization's activities,
833 products and services; and
- 834 c) establishing criteria for evaluating risk associated with threats and opportunities.

835 Issues identified when considering the organization's context, its significant environmental aspects or its
836 compliance obligations and their associated threats and opportunities are to be taken into account in
837 establishing, implementing maintaining and continually improving the organization's environmental
838 management system.

839 It is up to the organization to determine the nature and level of detail of the documented information it
840 develops.

841 **A.6.1.2 Significant environmental aspects**

842 6.1.2 sets out the process(es) an organization should use to identify its environmental aspects and associated
843 impacts, and to determine those that are significant which should be addressed as a priority by the
844 organization's environmental management system.

845 Changes to the environment, either adverse or beneficial, that result wholly or partially from environmental
846 aspects are called environmental impacts. The environmental impact may occur at local, regional and global
847 scales, while they may also be direct, indirect or cumulative by nature. The relationship between
848 environmental aspects and environmental impacts is one of cause and effect.

849 In the identification of environmental aspects the organization should apply a life cycle perspective. However,
850 this does not require a detailed life cycle assessment; a simple consideration of the life cycle stages which can
851 be controlled or influenced by the organization is sufficient. For this purpose the organization may obtain this
852 information directly or seek it from the supplier of the products and services. Information already developed for
853 regulatory or other purposes may be used in this process. Typical stages of a product life cycle can include,
854 for example, extraction of raw materials, design, production, transportation, use, and end-of-life treatment. The
855 life cycle stages that are applicable will vary depending on the activity, product or service.

856 An organization should identify the environmental aspects within the scope of its environmental management
857 system, taking into account the inputs and outputs (both intended and unintended) associated with its current
858 and relevant-past activities, products and services, planned or new developments, or new or modified
859 activities, products and services.

860 An emergency situation can be considered an undesired event that, if not addressed, could ultimately lead to
861 adverse consequences to the organization or the environment, as determined and prioritized during the
862 environmental management system planning stage. The process of environmental aspects identification
863 includes identification of normal and abnormal operating conditions, shut-down and start-up conditions, as well
864 as reasonably foreseeable emergency situations. Special attention should be paid to prior occurrences of
865 emergency situations, and results from testing emergency response procedures.

866 Organizations do not have to consider each product, component or raw material individually, and may select
867 categories of activities, products and services to identify and evaluate their environmental aspects, when they
868 can be managed in a common way.

869 Although there is no single approach for identifying environmental aspects, the approach selected could for
870 example include:

- 871 a) emissions to air;
- 872 b) releases to water;
- 873 c) releases to land;
- 874 d) use of raw materials and natural resources;
- 875 e) use of energy;
- 876 f) energy emitted, e.g. heat, radiation, vibration (noise) and light;
- 877 g) generation of waste and/or by-products;
- 878 h) environmental aspects with beneficial impact.

879 In addition to the environmental aspects an organization can control directly, an organization needs to
880 determine whether there are environmental aspects that it can influence. These can be related to products
881 and services used by the organization which are provided by others, as well as products and services that it
882 provides to others outside the organization, including those associated with outsourced processes. With
883 respect to products and services the organization provides and renders to others, organizations may have
884 limited influence on the use and final disposal of their products once they leave their control. However, in all
885 circumstances it is the organization that determines the degree of control it is able to exercise, the
886 environmental aspects it can influence, and the extent to which it chooses to exercise any such influence.

887 Consideration should be given to environmental aspects related to the organization's activities, products and
888 services, such as:

- 889 — design and development of its facilities, processes, products and services, including development of
890 products and services with reduced negative environmental impact;
- 891 — use of raw materials and natural resources;
- 892 — operational or manufacturing processes, including warehousing;
- 893 — operation and maintenance of facilities, organizational assets and infrastructure;
- 894 — environmental performance and practices of contractors and suppliers;

895 — product distribution and service delivery, including packaging and transportation;

896 — storage, use and end-of-life treatment of products;

897 — waste generation, management and disposal, including reuse, refurbishing, recycling.

898 There is no single method for determining significant environmental aspects. However, the method and criteria
899 used should provide consistent results.

900 An environmental aspect can cause an environmental impact therefore it can result in a threat or opportunity
901 that needs to be addressed in order to ensure the organization can achieve the intended outcomes of the
902 environmental management system. An environmental aspect having the potential to cause an adverse
903 impact to the environment can be considered a “threat”, whereas an environmental aspect having the potential
904 to cause a beneficial environmental impact can be considered an “opportunity”.

905 **A.6.1.3 Compliance obligations**

906 The organization needs to determine, at a detailed level, the compliance obligations it identified in 4.2 that are
907 applicable to its environmental aspects and how they apply to the organization. Compliance obligations
908 include legal and other mandatory obligations that the organization is required to comply with, and those
909 obligations which the organization has discretion over whether or not to adopt.

910 Legal obligations are mandatory requirements issued by governmental entities or other relevant authorities.
911 These may include:

912 — law and regulations;

913 — permits, licenses or other forms of authorization;

914 — orders, rules or guidance issued by regulatory agencies;

915 — judgments of courts or administrative tribunals;

916 — treaties, conventions and protocols.

917 Compliance obligations also include other interested party requirements related to its environmental aspects,
918 which the organization chooses to adopt. These may include, if applicable:

919 a) agreements with community groups or non-governmental organizations;

920 b) agreements with public authorities and customers;

921 c) organizational requirements;

922 d) voluntary principles or codes of practice;

923 e) voluntary labelling or environmental commitments;

924 f) obligations arising under contractual arrangements with the organization;

925 g) relevant organizational and industry standards.

926 The primary difference between a legal requirement and a voluntary obligation is that the organization
927 chooses to adhere to its voluntary obligations. However, once that choice is made, adherence becomes
928 mandatory, particularly where legally binding agreements are made.

929 **A.6.1.4 Risk associated with threats and opportunities**

930 Risk associated with threats and opportunities may be related to one or more of an organization's significant
 931 environmental aspects, compliance obligations or other issues, such as those created by external
 932 environmental conditions or by any internal circumstances. The organization determines the risk associated
 933 with threats or opportunities that can affect its ability to achieve the intended outcome of its environmental
 934 management system, prevent or reduce undesired effects or achieve continual improvement, and therefore
 935 needs to be addressed. An organization can determine the risk associated with threats and opportunities
 936 separately or in combination, and can integrate its approach with the analyses in previous sub-clauses (see
 937 6.1.2 and 6.1.3).

938 The organization selects the method by which risk associated with threats and opportunities is determined.
 939 The method may involve a very simple qualitative process or a full quantitative assessment, depending on the
 940 context in which the organization operates (e.g. size of the organization, technological sector, maturity level of
 941 the environmental management system).

942 The results of this determination are the input for planning actions (see 6.1.5) and for establishing the
 943 environmental objectives (see 6.2).

944 **A.6.1.5 Planning to take action**

945 Some of these threats and opportunities, including those created by other issues affecting the organization's
 946 ability to achieve the intended outcomes of the environmental management system, can also be important
 947 inputs for other parts of the management system, such as support (see Clause 7), operation (see Clause 8),
 948 performance evaluation (see Clause 9) and improvement (see Clause 10).

949 The planning may address the actions through a single or combination of pathways within the environmental
 950 management system, including, e.g. setting objectives, operational planning and control, emergency
 951 preparedness or monitoring and measurement.

952 Some actions may be addressed through other business processes such as occupational health and safety or
 953 business continuity management systems, or other processes related to risk, financial or human resource
 954 management.

955 **A.6.2 Environmental objectives and planning to achieve them**

956 Environmental objectives may be established by top management at the strategic level, the tactical level or
 957 the operational level. The strategic level includes the highest levels of the organization and the objectives are
 958 applicable to the whole organization. The tactical and operational levels can include objectives for specific
 959 units or functions within the organization and should be compatible with its strategic direction. The concept of
 960 "target" used in prior editions of this International Standard is captured within the definition of "environmental
 961 objective".

962 While the requirement to "*take into account significant environmental aspects*" does not mean that an
 963 objective has to be established for each significant aspect, it should be clear that significant aspects have a
 964 high priority when developing objectives.

965 "*Consistent with the environmental policy*" means that the environmental objectives need to be broadly aligned
 966 and harmonised with the commitments made by top management in the environmental policy.

967 Indicators are selected to measure the achievement of measurable objectives. By including the caveat '*where
 968 practicable*', it is acknowledged that there may be situations when it may not be feasible to measure an
 969 objective. More guidance on setting environmental indicators can be found in ISO 14031.

970 **A.7 Support**

971 **A.7.1 Resources**

972 Resources include human resources, natural resources, infrastructure, technology, and financial resources.

973 Human resources include specialized skills and knowledge. Infrastructure includes the organization's
974 buildings, containment systems, pumps, etc.

975 **A.7.2 Competence**

976 This sub-clause applies to any person(s):

977 a) whose work has the potential to cause a significant environmental impact;

978 b) who are assigned responsibilities for the environmental management system, including those who:

979 1) identify and evaluate environmental impacts and compliance obligations;

980 2) contribute to the achievement of an environmental objective;

981 3) respond to emergency situations;

982 4) perform internal audits;

983 c) who otherwise affect(s) environmental performance.

984 **A.7.3 Awareness**

985 Awareness of the environmental policy should not be taken to mean that the commitments need to be
986 memorized or that persons doing work under the organization's control have a copy of the actual, documented
987 environmental policy; rather, they should be aware of its existence, the purpose and their role in achieving the
988 commitments.

989 **A.7.4 Communication**

990 Communication allows the organization to provide and obtain information relevant to its environmental
991 management system, including its significant environmental aspects, environmental performance and
992 compliance obligations. The communication process is seen as a two-way process, in and out of the
993 organization.

994 The information received by the organization may contain requests from interested parties for specific
995 information related to the management of its environmental aspects, and also general impressions or views on
996 the way the organization carries out that management. These views can be either positive or negative in
997 nature. In the latter case (e.g. complaints), it is important a prompt and clear answer is provided by the
998 organization. A subsequent analysis of these complaints can provide valuable information for detecting
999 improvement opportunities for the environmental management system.

1000 In determining how it will communicate, the organization should consider:

1001 a) methods, including verbal or written;

1002 b) tools, including internet, letter, video or reports;

1003 c) who communicates.

1004 Communication should be:

- 1005 — transparent, so the organization is open to the way it derived what it has reported on;
- 1006 — appropriate, so that information meets relevant interested parties' needs, enabling them to participate;
- 1007 — truthful and not misleading those who rely on the information reported;
- 1008 — factual, accurate and reliable, ensured by robust systems and procedures;
- 1009 — complete in its own context and does not exclude relevant information;
- 1010 — clear and understandable to interested parties.
- 1011 When planning, the internal organizational structure should be considered to ensure communication with the
 1012 most appropriate levels and functions. Communication with each person doing work under its control may not
 1013 be needed; a single approach to the whole organization may be adequate to meet the objectives of its
 1014 communication.
- 1015 For additional information on communication see ISO 14063.
- 1016 **A.7.5 Documented information**
- 1017 The intent of 7.5 is to ensure that organizations create and maintain documented information in a manner
 1018 sufficient to implement the environmental management system. The primary focus of organizations, however,
 1019 should be on the effective implementation of the environmental management system and on environmental
 1020 performance, not on a complex documented information control system.
- 1021 Documented information originally created for purposes other than the environmental management system,
 1022 may be used. The documented information for the environmental management system may be integrated with
 1023 other information management systems implemented by the organization. It does not have to be in the form of
 1024 a manual.
- 1025 **A.8 Operation**
- 1026 **A.8.1 Operational planning and control**
- 1027 The types and degrees of operational control depend on the nature of the operations, the significant
 1028 environmental aspects, risk associated with threats and opportunities, and compliance obligations. An
 1029 organization has the flexibility to select the type(s) of operational control methods, singly or in combination,
 1030 necessary to make sure a process is effective in achieving the desired results. Such methods may include:
- 1031 a) designing a process in such a way to prevent error and ensure consistent results;
- 1032 b) using technology to control processes and prevent adverse results (i.e., engineered controls);
- 1033 c) using competent personnel to assure desired results;
- 1034 d) performing the process in a specified way (i.e., procedure);
- 1035 e) monitoring or measuring the process to check the results;
- 1036 f) determining the use and amount of documented information necessary.
- 1037 Work that is '*under the organization's control*' is work that takes place within the scope of the environmental
 1038 management system.

1039 The organization decides the extent of control needed within its own business processes (e.g., procurement
1040 process) to control or influence outsourced processes (see explanation below) or suppliers of products and
1041 services, based upon factors such as:

1042 — knowledge, competence and resources, including:

1043 — the competence of the supplier to meet the requirements of the organization's environmental
1044 management system;

1045 — the technical competence of the organization to define appropriate controls or assess the adequacy
1046 of controls;

1047 — the importance and potential impact on the organization's capability to provide products and services that
1048 conform to the intended outcomes of the environmental management system, including the risk of
1049 deviation from its environmental policy, objectives, and compliance obligations;

1050 — the degree to which the control for the process is shared;

1051 — the capability of achieving the necessary control through the application of its general procurement
1052 process;

1053 — opportunities available.

1054 In the case of work performed via outsourced processes (see explanation below) or supplied products and
1055 services, the organization's ability to exert control or influence will vary, from direct control to limited or no
1056 influence. For example, an outsourced process performed onsite may be under the direct control of a large
1057 organization. Alternatively, the ability of small and medium size organizations to influence an outsourced
1058 process or supplier may be limited by their relative size.

1059 An outsourced process is one which:

1060 — the function or process is integral to the organization's functioning;

1061 — the function or process is needed for the management system to achieve its intended outcome;

1062 — liability for the function or process conforming to requirements is retained by the organization; and

1063 — the organization and the external provider have an integral relationship e.g. one where the process is
1064 perceived by interested parties as being carried out by the organization.

1065 **A.8.2 Emergency preparedness and response**

1066 This International Standard does not contain explanatory information on 8.2.

1067 **A.9 Performance evaluation**

1068 **A.9.1 Monitoring, measurement, analysis and evaluation**

1069 **A.9.1.1 General**

1070 In order to ensure that its environmental policy and environmental objectives are achieved, the organization
1071 should ensure that:

1072 a) the results of monitoring and measurement are reliable, reproducible and traceable;

1073 b) the way in which data resulting from monitoring and measurement are aggregated before any analysis
1074 and evaluation takes place is clearly defined and reproducible;

1075 c) the findings of analysis and evaluation of environmental performance are reported internally to those with
1076 responsibility and authority to initiate appropriate action;

1077 d) the information obtained is communicated externally in accordance with compliance obligations.

1078 **A.9.1.2 Evaluation of compliance**

1079 The frequency and timing of evaluations of compliance may vary depending on the importance of the
1080 requirement, variations in operating conditions and the organization's past performance, however all
1081 compliance obligations need to be evaluated.

1082 An organization can use a variety of methods to maintain its knowledge and understanding of its compliance
1083 status, including:

1084 a) facility tours or inspections;

1085 b) direct observations or interviews;

1086 c) project or work reviews;

1087 d) review of sample analyses or test results, and comparison to regulatory limits;

1088 e) verification sampling or testing.

1089 In the event that the results indicate a failure to meet a legal requirement, the organization should determine
1090 and implement the actions necessary to achieve compliance. This may require communication with a
1091 regulatory agency and agreement on a course of action to re-establish compliance with legal requirements.
1092 Where such an agreement is in place, this becomes a compliance obligation.

1093 A non-compliance may not rise to the level of a system nonconformity if, for example, it is identified and
1094 corrected by the environmental management system processes. Further, compliance-related system non-
1095 conformities that are detected must be corrected, even if those nonconformities have not resulted in actual
1096 non-compliance with legal requirements.

1097 **A.9.2 Internal audit**

1098 The management and conduct of internal audits should abide by the principles of integrity, fair presentation,
1099 due professional care, confidentiality, independence and an evidence-based approach.

1100 Auditors should be independent of the activity being audited, wherever practicable, and should in all cases act
1101 in a manner that is free from bias and conflict of interest.

1102 The extent of the audit programme should be based on the size and nature of the organization, as well as the
1103 complexity and level of maturity of the environmental management system.

1104 When considering the environmental importance of the processes concerned in its audit programme, the
1105 organization should include:

1106 a) the plans made and actions taken to address the organization's significant environmental aspects and
1107 compliance obligations;

1108 b) the outputs of its monitoring and measurement processes;

1109 c) previous occurrences of accidents or emergency situations that resulted in or could have resulted in
1110 environmental impacts.

1111 When considering the results of previous audits, the organization should include:

1112 — previously identified nonconformities and the effectiveness of the actions taken;

1113 — results of internal and external audits.

1114 Guidance on establishing an internal audit programme, performing environmental management system audits
1115 and evaluating the competence of audit personnel is given in ISO 19011.

1116 **A.9.3 Management review**

1117 The management review should be high-level; it does not need to be an exhaustive review of the details.

1118 The management review topics need not be addressed all at once; the review may take place over a period of
1119 time.

1120 It should be noted that communication(s) from external interested parties include complaints. Therefore, the
1121 information submitted for analysis to top management should include the relevant complaints received from
1122 interested parties, which may provide direct information that will allow top management to determine
1123 opportunities for improvement.

1124 **A.10 Improvement**

1125 **A.10.1 Nonconformity and corrective action**

1126 Documented information may include the corrective action taken, the results of corrective action and
1127 information on the review of the effectiveness of those actions.

1128 There is no longer a single clause with specific requirements for 'preventive action' because one of the key
1129 purposes of an environmental management system is to act as a preventive tool. This concept is now
1130 captured in 4.1 (i.e., Understanding the organization and its context) and 6.1 (i.e., Actions to address risk
1131 associated with threats and opportunities). In combination, these two sets of requirements are considered to
1132 cover the concept of preventive action.

1133 **A.10.2 Continual improvement**

1134 The rate, extent and timescale of actions that support continual improvement are determined by the
1135 organization. Although there may be value in improving the system elements alone, the intended outcome of
1136 planned actions and other system changes is an enhancement in the environmental performance of the
1137 organization.

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Annex B (informative)

Correspondence between ISO/DIS 14001:2014 and ISO 14001:2004

1142

1143 Table B.1 shows the correspondence between ISO/DIS 14001:2014 and ISO 14001:2004. Table B.2 shows
1144 the correspondence between ISO 14001:2004 and ISO/DIS 14001:2014.

1145

Table B.1 — Correspondence between ISO/DIS 14001:2014 and ISO 14001:2004

ISO/DIS 14001:2014		ISO 14001:2004	
Context of the organization (title only)	4		
Understanding the organization and its context	4.1		
Understanding the needs and expectations of interested parties	4.2		
Determining the scope of the environmental management system	4.3	4.1	General requirements
Environmental management system	4.4	4.1	General requirements
Leadership (title only)	5		
Leadership and commitment	5.1		
Environmental policy	5.2	4.2	Environmental policy
Organizational roles, responsibilities and authorities	5.3	4.4.1	Resources, roles, responsibility and authority
Planning (title only)	6	4.3	Planning (title only)
Actions to address risk associated with threats and opportunities (title only)	6.1		
General	6.1.1		
Significant environmental aspects	6.1.2	4.3.1	Environmental aspects
Compliance obligations	6.1.3	4.3.2	Legal and other requirements
Risk associated with threats and opportunities	6.1.4		
Planning to take action	6.1.5		
Environmental objectives and planning to achieve them (title only)	6.2	4.3.3	Objectives, targets and programme(s)
Environmental objectives	6.2.1	4.3.3	Objectives, targets and programme(s)
Planning actions to achieve environmental objectives	6.2.2	4.3.3	Objectives, targets and programme(s)
Support (title only)	7	4.4	Implementation and operation (title only)
Resources	7.1	4.4.1	Resources, roles, responsibility and authority
Competence	7.2	4.4.2	Competence, training and awareness
Awareness	7.3	4.4.2	Competence, training and awareness
Communication (title only)	7.4	4.4.3	Communication
General	7.4.1	4.4.3	Communication
Internal communication	7.4.2	4.4.3	Communication
External communication	7.4.3	4.4.3	Communication
Documented information (title only)	7.5	4.4.4	Documentation

1146

Table B.1 (continued)

ISO/DIS 14001:2014		ISO 14001:2004	
General	7.5.1	4.4.4	Documentation
Creating and updating	7.5.2	4.4.5	Control of documentation
Control of documented information	7.5.3	4.5.4	Control of records
		4.4.5	Control of documentation
Operation (title only)	8	4.5.4	Control of records
		4.4	Implementation and operation (title only)
Operational planning and control	8.1	4.4.6	Operational control
Emergency preparedness and response	8.2	4.4.7	Emergency preparedness and response
Performance evaluation (title only)	9	4.5	Checking (title only)
Monitoring, measurement, analysis and evaluation (title only)	9.1	4.5.1	Monitoring and measurement
General	9.1.1	4.5.1	Monitoring and measurement
Evaluation of compliance	9.1.2	4.5.2	Evaluation of compliance
Internal audit	9.2	4.5.5	Internal audit
Management review	9.3	4.6	Management review
Improvement (title only)	10		
Nonconformity and corrective action	10.1	4.5.3	Nonconformity, corrective action and preventive action
Continual improvement	10.2		

1147

1148

Table B.2 — Correspondence between ISO 14001:2004 and ISO/DIS 14001:2014

ISO 14001:2004		ISO/DIS 14001:2014	
		4	Context of the organization (title only)
		4.1	Understanding the organization and its context
		4.2	Understanding the needs and expectations of interested parties
Environmental management system requirements (title only)	4		
General requirements	4.1	4.3	Determining the scope of the environmental management system
		4.4	Environmental management system
		5	Leadership (title only)
		5.1	Leadership and commitment
Environmental policy	4.2	5.2	Environmental policy
Planning (title only)	4.3	6	Planning (title only)
		6.1	Actions to address risk associated with threats and opportunities (title only)
		6.1.1	General
Environmental aspects	4.3.1	6.1.2	Significant environmental aspects
Legal and other requirements	4.3.2	6.1.3	Compliance obligations
		6.1.4	Risk associated with threats and opportunities
		6.1.5	Planning to take action
Objectives, targets and programme(s)	4.3.3	6.2	Environmental objectives and planning to achieve them (title only)
		6.2.1	Environmental objectives
		6.2.2	Planning actions to achieve environmental objectives

1149

Table B.2 (continued)

ISO 14001:2004		ISO/DIS 14001:2014	
Implementation and operation (title only)	4.4	7	Support (title only)
		8	Operation (title only)
Resources, roles, responsibility and authority	4.4.1	7.1	Resources
		5.3	Organizational roles, responsibilities and authorities
Competence, training and awareness	4.4.2	7.2	Competence
		7.3	Awareness
Communication	4.4.3	7.4	Communication (title only)
		7.4.1	General
		7.4.2	Internal communication
		7.4.3	External communication
Documentation	4.4.4	7.5	Documented information (title only)
		7.5.1	General
Control of documentation	4.4.5	7.5.2	Creating and updating
		7.5.3	Control of documented information
Operational control	4.4.6	8.1	Operational planning and control
Emergency preparedness and response	4.4.7	8.2	Emergency preparedness and response
Checking (title only)	4.5	9	Performance evaluation (title only)
Monitoring and measurement	4.5.1	9.1	Monitoring, measurement, analysis and evaluation (title only)
		9.1.1	General
Evaluation of compliance	4.5.2	9.1.2	Evaluation of compliance
Nonconformity, corrective action and preventive action	4.5.3	10.1	Nonconformity and corrective action
Control of records	4.5.4	7.5.2	Creating and updating
		7.5.3	Control of documented information
Internal audit	4.5.5	9.2	Internal audit
Management review	4.6	9.3	Management review
		10	Improvement (title only)
		10.2	Continual improvement

**Annex C
(informative)**

Alphabetical index of terms in Clause 3

- 1150
1151
1152
1153
- 1154
- 1155 The list in this Annex will be ordered according to the alphabetical order in the language into which this
1156 International Standard is translated.
- 1157 **audit** 3.28
1158 **competence** 3.19
1159 **compliance obligation** 3.22
1160 **conformity** 3.23
1161 **continual improvement** 3.29
1162 **corrective action** 3.25
1163 **documented information** 3.7
1164 **effectiveness** 3.20
1165 **environment** 3.8
1166 **environmental aspect** 3.9
1167 **environmental condition** 3.11
1168 **environmental impact** 3.10
1169 **environmental management system** 3.4
1170 **environmental objective** 3.17
1171 **environmental performance** 3.13
1172 **environmental policy** 3.6
1173 **indicator** 3.33
1174 **interested party** 3.5
1175 **life cycle** 3.15
1176 **management system** 3.3
1177 **measurement** 3.27
1178 **monitoring** 3.31
1179 **nonconformity** 3.24
1180 **objective** 3.16
1181 **organization** 3.1
1182 **outsource** (verb) 3.32
1183 **performance** 3.12
1184 **prevention of pollution** 3.14
1185 **procedure** 3.30
1186 **process** 3.26
1187 **requirement** 3.21
1188 **risk** 3.18
1189 **top management** 3.2

1190

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- 1192
- 1193 ISO 14031, *Environmental management — Environmental performance evaluation — Guidelines*
- 1194 ISO 14044, *Environmental management — Life cycle assessment — Requirements and guidelines*
- 1195 ISO 14063, *Environmental management — Environmental communication — Guidelines and examples*
- 1196 ISO 19011, *Guidelines for auditing management systems*
- 1197 ISO/IEC Guide 73, *Risk management. Vocabulary. Guidelines for use in standards*